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Journal of Educational Research

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JOURNAL OF EDUCATIONAL RESEARCH

This journal was established to support educational research workers in all phases of the great problems of teaching. Started in 1920 under the editorship of Dr. B. R. Buckingham and associates among the members of an association of directors of educational research, and accepted as the official organ of the Educational Research Association, its purpose has at no time been confined to a narrow line of specialized research but has been concerned also with professional applications for all workers in education.

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JOURNAL *of* EDUCATIONAL RESEARCH

Volume XVIII DECEMBER 1928 Number 5

THE ANALYSIS AND EVALUATION OF COLLEGE AND UNIVERSITY COURSES IN EDUCATION[1]

W. E. Peik
University of Minnesota

PURPOSE OF THE STUDY

This investigation had for its objective an intensive study of the required training program for prospective high-school teachers as offered in a single institution. It was prompted by a realization, gained from the literature, that among colleges and universities throughout the country such professional curricula are unstandardized as to the number of hours prescribed, the title of the subjects selected, the content of courses offered under similar names, and the amount of technical and practical training provided. A special need for this investigation was felt because previous curricular studies had not covered intensively the distinctive offerings of individual institutions. Locally, a further motive asserted itself in the desire to test the professional applicability of the preparation given to the actual needs of beginning secondary teachers in the field. Back of it all was the assumption that college curriculum studies are possible, and are likely to be profitable, just as recent curricular studies have proven profitable at the elementary and secondary school levels.

EXPOSITION OF THE METHOD

In broad outline, the procedure consisted of the following steps:

1. An analysis of the prescribed courses into ultimate units or topics of instruction.
2. Identification and analysis of the treatment emphasis given to each of these units by the instructors.
3. Evaluation by alumni of the training given them on each of these topics.
4. Identification of the units of content which are most and least worth while to teachers.

[1] The complete report of the investigation is to be published later. At present it is on file in the College of Education, of the University of Minnesota, Minneapolis, Minnesota. This paper was presented before the Institute on Higher Education held at the University of Minnesota, July 9 to July 20, 1928.

5. Selection and organization of the units found most worth while into basic courses as their carriers.
6. Further course refinement and improvement through the modification of present treatment emphasis to topics in order to meet the indicated needs of teachers.

THE ANALYSIS OF CONTENT

The courses in education prescribed by the College of Education of the University of Minnesota since 1923 and up to 1928 were:

Brief Course in the History of Education	5 quarter credits
or	
History of Education (complete course)	9 quarter credits
Educational Sociology	3 quarter credits
Educational Psychology[2]	3 quarter credits
The High School	3 quarter credits
Technique of High-School Instruction	3 quarter credits
Special Methods in the major academic field	3 quarter credits
Practice Teaching and Observation in the major academic field	5 quarter credits
or	
A unified, professional course including Special Methods, Observation, and Practice Teaching in the major academic field	9 quarter credits
Total	25 to 30 quarter credits

Altogether there were special methods and practice teaching courses in fifteen academic subjects. Only eight were selected to represent the major fields. These were English, French, German, history, Latin, mathematics, natural sciences, and social studies.

The thirteen instructors of these courses submitted syllabi or complete sets of lesson units. These were analyzed into 814 topics of instruction, which for the purposes of the investigation were called "The Checking List." The list identified with considerable detail the content of the prescribed professional equipment with which Minnesota graduates left for their first high-school teaching positions after graduation. The first twenty-two topics may be seen in Table I, which shows the general nature and organization of the Checking List.

ANALYSIS OF TREATMENT

We next undertook an analysis of the treatment which this content received at the hands of instructors. The canvassed data as tabulated in a master table supplied the following types of information regarding each topic:

1. The courses which use it as a *major* topic.
2. The *time* allotted to it as a *major* topic by *each* course.

[2] Educational Psychology was preceded by a prerequisite of six quarter credits in General Psychology which, however, is not classified as a course in Education.

3. The *total time* allotted to it as a *major* topic by *all* courses.
4. The *average time* allotted to it as a *major* topic by *special methods* courses.
5. The *courses* which use it as *minor* topic.
6. The *time* allotted to it as a *minor* topic by *each course*.
7. The *total time* allotted to it as a *minor* topic by *all* courses.
8. *The average time* allotted to it as a *minor* topic by *special methods* courses.
9. The frequency of *regular* treatment by *all* courses.
10. The *courses* which give it *incidental consideration* only.
11. The *frequency* of *incidental* treatment by *all* courses.
12. The *courses* which make *reference reading assignments*.
13. The *frequency* of *reference reading assignments* by *all* courses.
14. The *assumptions* of each instructor regarding the *extent* of treatment to be given to *each topic by himself*.
15. The assumptions of instructors regarding the treatment of the topics of their own courses by other instructors.

The master table, which carried these data, was used for reference and as a source of raw material for the study of special problems relating to the character and content of the offering as a whole, of each constituent course, and of each instructional unit. A rather complete analysis of the treatment accorded to each of the 814 topics was its essential and most useful feature.

ALUMNI EVALUATION OF PRESENT TRAINING

To carry out a method of evaluation, a questionnaire was sent to those of 599 alumni with University Teacher's Certificates in high-school subjects, in the classes of '23, '24, and '25, who had pledged their coöperation in answer to a letter from the Dean of the College of Education and another from the writer. There were 188 returns of which 100 were utilized. This response was gratifying in view of the fact that the checking requested consumed most or all of a half day and required over 4100 judgments.

The check list was accompanied by a request for information regarding college preparation, subjects taught since graduation, and outstanding teaching problems. It asked for a ranking of the *courses* in education: first, with respect to direct helpfulness in actual teaching; second, with respect to direct or indirect helpfulness in educational thinking; and third, with respect to general helpfulness from all points of view. It also invited frank criticisms of the courses and constructive suggestions for improving them. These general reactions were used to ascertain general attitudes. Such were found to be present relative to: duplication, lack of concrete training, more emphasis to special methods and practice teaching, suggested course combinations, etc.

The most important feature of the evaluation procedure called for more specific reactions to each of the 814 topics. Every alumnus was

requested to check: (1) all topics the treatment of which he remembered to have occurred somewhere in the prescribed courses; (2) all topics the treatment of which he had found of definite helpfulness in actual classroom teaching; (3) all topics the treatment of which he had found indirectly or directly helpful in educational thinking; (4) all topics the treatment of which he believed should be omitted from the courses; and (5) all topics the treatment of which he considered inadequate.

The percentages based on a count of the checks by alumni make up the third master table of the study. Its general nature and form is presented in Table I.

TABLE I

REACTIONS OF ALUMNI TO THE TREATMENT ACCORDED THE TOPICS OF THE PRESCRIBED PROFESSIONAL COURSES IN EDUCATION

Topic Number	Topic	Col.[1] 1	Col.[2] 2	Col.[3] 3	Col.[4] 4	Col.[5] 5
1.	*Activity—Self-activity*	79	29	45	2	7
2.	Historical evolution of the educational doctrine of self-activity	63	5	33	19	2
3.	Self-activity in the kindergarten	62	8	27	23	1
4.	Self-activity in educational method	75	37	53	4	6
5.	Physical and motor activity in education	79	27	44	7	4
6.	Learning by experience	94	60	70	3	8
7.	Play and education	90	52	59	4	5
8.	Education of the will	28	19	24	3	9
9.	*Administrative activities of the classroom teacher*	74	46	14	3	22
10.	Attendance; Seating plans, etc.	79	64	10	6	21
11.	Care of supplies	41	32	4	15	24
12.	Assignment of texts; Records	61	47	9	9	29
13.	Periodic reports	49	33	6	10	31
14.	Notes to parents	29	23	3	11	23
15.	Halls; Study halls; Assembly	51	37	5	6	37
16.	Home room groups	30	19	6	7	25
17.	Faculty and committee meetings	60	33	13	10	19
18.	Care of keys, responsibility for buildings, *etc.*	26	17	4	17	14
19.	Miscellaneous administrative activities and responsibilities	51	24	9	7	28
20.	*The place of the assignment in the daily recitation*	89	75	30	0	6
21.	Characteristics of good or bad assignments	96	92	35	0	15
22.	The aims and importance of the assignment	98	88	46	0	11

[1] Col. 1—Percent of Alumni Remembering the Treatment of the Topic in the Prescribed Courses.
[2] Col. 2—Percent of Alumni Who Have Found the Treatment Accorded the Topic Helpful in Actual Teaching.
[3] Col. 3—Percent of Alumni Who Have Found the Treatment Accorded the Topic Helpful in Educational Thinking.
[4] Col. 4—Percent of Alumni Believing Treatment of the Topic Should be Omitted.
[5] Col. 5—Percent of Alumni Believing the Treatment Accorded the Topic to have been Inadequate.

One of the most useful features of the procedure was the utilization of the data for an intensive study of each major and minor topic of the checking list with respect to all points of treatment emphasis and alumni evaluation which were studied. This was done graphically by means of a profile which, as may be seen in Table II, gave the relative placement of the topic with respect to all other topics on a chart that contained the deciles of seventeen distribution tables, each of which covered some item

of treatment or evaluation. The profile chart, in itself, is a statistical summary of findings which presents the range, variability by deciles, and the median in the "50" column for each of the distributions. The profile shows the relative decile placement of the topic concerned on each scale. Table II presents such a profile for Topic No. I, *Activity—Self-Activity*. Whenever the profile goes far to the right it signifies high relative placement and whenever it extends well to the left it signifies low relative placement with respect to the other topics.

Table II contains four major divisions of information:

I. An analysis of present treatment of the topic
II. An evaluation of present topic treatment by alumni
III. Percent of alumni having related beginners' teaching problems, grouped by major topics only
IV. Comments and suggestions based on the findings

For each topic such a profile shows consecutively from top to bottom:

I. A—1. Frequency of its regular treatment in the five general courses
2. Frequency of its incidental treatment in the five general courses
3. Frequency of reading assignment in the five general courses
4. Total time allotment, as a major topic and as a minor topic, in the five general courses

B—1. Frequency of its regular treatment in the eight special methods courses
2. Frequency of its incidental treatment in the eight special methods courses
3. Frequency of reading assignment in the eight special methods courses
4. Average time allotment, as a minor topic and as a major topic, in the eight special methods courses

II. A—Percent of alumni who remember its treatment in the prescribed courses
B—Percent of alumni who believe present treatment to be definitely helpful in actual teaching
C—Percent of alumni who believe present treatment to be helpful in educational thinking
D—The index of general functioning value (sum of the percents in 11 B and 11 C)
E—Percent of alumni who suggest omission of the topic from the prescribed courses
F—Percent of alumni who believe present treatment of the topic to be inadequate

III. A—Percent of alumni who have a related, beginner's teaching problem (major topics only)

OBJECTIVE SELECTION AND REJECTION OF CONTENT

Three of the measures of alumni evaluation given in Section II of Table II, were used as objective criteria for the identification of content most and least worth while to teachers. The percent of alumni having related beginners' teaching problems was added as a fourth. Arbitrarily, for reasons which we cannot take space to discuss here, four standards were chosen. A topic was selected as most worth while if it met the standard of one or more of these criteria, as follows:

Criterion I. The topic is recommended for omission from the course by less than five percent of alumni. (See II E, Table II)
Criterion II. The index of functioning value[3] is above 49. (See II D, Table II)
Criterion III. It is considered inadequately treated by five or more than five percent of alumni. (See II F, Table II)
Criterion IV. Five or more percent of the alumni have problems related to the major topic groups. (See III A, Table II)

Topic No. I, *Activity—Self-activity* of Table II, meets all of these standards. All but 111 topics of 814 of the checking list met the rather low test of this battery. By increasing the standard to any severity desired, additional topics could be rejected as of relatively least values.

TABLE II

A topic profile which contains: under I, an analysis of present treatment accorded to the topic; under II, the evaluation of present treatment by alumni; and under III, for major topics only, the percent of alumni who have had a related, outstanding, beginner's teaching problem. The procedure followed is to show the relative placement of the topic with reference to the deciles on each of seventeen scales.*

Topic No. 1 Topic statement: ACTIVITY - SELF-ACTIVITY

Kind of Scale		(Low) Deciles									(High)
	0	10	20	30	40	50	60	70	80	90	100
I. ANALYSIS OF PRESENT TREATMENT											
A—In the 5 general courses:											
1—Frequency of regular treatment	0	1	1	1	1	1	1	2	2	3	5
2—Frequency of incidental treatment	0	1	1	1	1	1	1	1	2	2	4
3—Frequency of reading assignment	0	1	1	1	1	1	1	1	2	2	4
4—Total time allotment: as minor topic	0	3	6	9	12	15	18	24	27	48	300
4—Total time allotment: as major topic	0	50	50	50	50	50	100	100	175	300	1000
B—In the 8 special methods courses:											
1—Frequency of regular treatment	0	1	1	1	1	2	2	4	5	6	8
2—Frequency of incidental treatment	0	1	1	1	2	2	2	3	3	4	6
3—Frequency of reading assignment	0	1	1	1	1	1	2	3	4	8	
4—Average time allotment: as minor topic	0	4	6	8	10	13	15	20	28	51	180
4—Average time allotment: as major topic	0	25	50	50	50	100	100	150	150	300	2400
II. EVALUATION OF PRESENT TREATMENT											
A—Per cent of alumni who remember its treatment in the prescribed courses	0	38	49	65	68	75	78	81	88	94	100
B—Per cent of alumni who believe present treatment to be definitely helpful in actual teaching	0	3	8	12	18	24	31	38	46	53	92
C—Per cent of alumni who believe present treatment to be helpful in educational thinking	0	9	15	22	28	33	38	43	48	53	81
D—The index of general functioning value (sum of the per cents in II B and II C)	0	23	34	42	49	58	67	77	87	102	159
E—Per cent of alumni who suggest omission of the topic from the prescribed courses*	×	19	10	6	5	4	3	2	2	1	1
F—Per cent of alumni who believe present treatment of the topic to be inadequate*	×	26	17	15	12	9	6	4	3	1	1
III. RELATED BEGINNER'S TEACHING PROBLEMS											
A—Per cent of alumni who have a related, beginner's teaching problem (major topics only)	0	2	3	5	6	13	16	20	24	38	50

[3] The index of functioning value of each topic is found by adding the percent who have found present topic treatment of direct helpfulness in actual teaching to the percent who have found present treatment of direct or indirect helpfulness in educational thinking (See Columns 2 and 3 of Table I). The Correlation of these two measures for the Checking List is only +.11.

TABLE II—(Continued)

IV. COMMENTS AND SUGGESTIONS—TOPICS NOS. 1 TO 8, INCLUSIVE. GENERAL STATEMENT

The transfer of Ed. 1 and Ed. 3 from the required to the elective courses in education removes a part or all of this content from prescribed treatment. Such readjustments as are consequently necessary in other courses should be determined through conference.

Check the recurring treatments for articulation, overlapping and duplication. General courses which spend more than five minutes upon the topics of this group are: Ed. 1, 115 minutes; Ed. 3, 70 minutes; Ed. Psy. 55, 5 minutes; Ed. 15, 50 minutes.

The following, often abbreviated or partial, statements are typical of related problems which beginning teachers list as outstanding. (III A)

How not to do too much for the students.
Lecturing too much.
To get adequate preparation on pupils' part.
Pupils had to be coaxed along.
To keep from making the recitation the teacher's and not the pupils'.
Where to secure pupil self-activity.
How to make students work without giving too many written tests.
Doing too much of the work myself.

Topic No. 1

Check the recurring treatments for articulation, overlapping, and duplication.

General courses which spend more than five minutes each upon this topic are: Ed. 1, 13 minutes; Ed. 3, 5 minutes.

High in treatment emphasis. (See I-A1, I-A3, I-A4)

* Topics with zero value in a distribution are checked in the zero column, except in II E and II F where they are checked in the margin. In II E and II F the reverse order of size of percents is used; in these two cases the higher the percents the lower must be the estimate of present treatment. These two scales begin at 40 and 45, respectively.

All major topics are typed in capitals; others, in small letters.

THE DETERMINATION OF BASIC COURSES

The next step in such a procedure is to classify the content which is accepted or rejected. At the above low standards, practically all purely historical topic groups are eliminated. The accepted content related rather logically to learning, which called for the course in educational psychology, to teaching, which called for the courses in general and special methods, and to the high school as an institution, which demanded a course in the principles of secondary education. In addition, there were ten major topic groups, about 9 percent of the checking list, of miscellaneous origin, but more largely from educational sociology than any other. They were orientational and general in nature. This residue does not seem to justify eight credits of orientation devoted to separate historical and sociological approaches to education in the history of education and in educational sociology, in addition to the course covering the principles in secondary education.

INCREASING THE FUNCTIONAL LEVEL OF EACH OF THE COURSES

For the checking list as a whole, the median percent of alumni who found present topic treatments of practical value was only 24 percent (Table II, II B, Col. 50), the median for theoretic value lay at 33 percent (Table II, II C, Col. 50), and the median index of functioning value was 58 (Table II, II D, Col. 50) in a possible range of from 0 to 200. Ap-

parently these central tendencies can be raised by rejection of topics which fail to function and by more attention to topics which can be made to function more widely. Other types of improvement are possible, such as the elimination of duplication and the improvement of articulation in recurring treatments. These refinements must be undertaken first of all in conference and then by the respective instructors. For faculty use there was made available the complete analysis in five supplementary volumes including the topic profiles (like Table II) of all topics and the arrangement of the 814 topics from highest to lowest with respect to many phases of treatment and of alumni evaluation. To illustrate the nature of the data supplied, Table III presents a sample page from one of these

TABLE III

SHOWING TOPICS OF THE CHECKING LIST ARRANGED FROM HIGHEST TO LOWEST IN ORDER OF THEIR INDICES OF FUNCTIONING VALUE*
(Sample page from highest quartile)

TOPIC NO.	TOPIC STATEMENT	INDEX
383	Individual differences in mental capacity	159
382	Individual differences in school achievement of high-school pupils	152
370	Adolescence; its characteristics; relation to high-school work	140
385	Need of provision for individual differences in high-school instruction	138
384	Sex differences	136
517	Proper use of leisure as an objective of education	136
437	Motivation	134
324	Drill and its place in high-school instruction	134
22	The aims and importance of the assignment	134
566	Practice teaching in	133
386	Classification of pupils on the basis of ability	131
515	Worthy home life as an objective of education, secondary education	131
424	Review. Its psychology	130
434	Interest	129
435	Attention	129
510	Objectives of secondary education	129
516	Ethical conduct as an objective of education	129
513	Cardinal principles of secondary education	128
545	Observation of teaching in	128
21	Characteristics of good or bad assignments	127
518	Mastery of fundamentals as an objective of education	126
508	General objectives in education	124
458	Unreliability and variability of teachers' subsequent marks	123
514	Health as an objective of education	123
520	Citizenship as an objective of education	123
613	The problem of the retarded and accelerated pupil	122
662	Types of questions—good and bad	122
393	Individual differences due to social development	121
376	Mental traits of high-school pupils	119
394	Individual differences due to interests	119
436	Effort	119
640	Individual differences in learning	119
519	Vocational efficiency as an objective of high-school education	117
95	Educational aims and curriculum	116
419	The laws of learning (primary, secondary)	116

* Because the correlation of the measures of practical and of theoretical value of topic treatments to alumni was only +.11, they were added for each topic to give weight to both outcomes. The sum was called the index of functioning value of the topic. It represents the number of times that 100 alumni have checked the topic for direct helpfulness in actual teaching and for direct or indirect helpfulness in thinking about educational matters.

larger tables which lists, by quartiles, from highest to lowest, the 814 topics according to the index of functioning value. Other tables cover in the same way all of the items in Table I which are also found in Table II, under II-A, B, C, E, and F.

The procedure outlined represents a program of curriculum analysis, evaluation, and reconstruction, which is applicable to any series of courses. The local nature of the study and the relatively small number of alumni teachers canvassed must make many of the conclusions based upon the findings local and tentative.

SOME TYPICAL FINDINGS

1. As many topics are treated incidentally in the education courses studied as are scheduled for regular treatment.

2. On an average each topic of the checking list is treated regularly and incidentally 2.58 times. The extent of recurring treatment is sufficient to provide ample opportunity for duplication, overlapping, and poor articulation unless precautions are taken against their occurrence.

3. The assumptions of instructors regarding the treatment accorded their own topics in other courses is correct in about two-thirds of the cases and wrong in about one-third of the cases. Of the wrong assumptions, two-thirds expect less than is given and one-third expect more than is given.

4. Courses vary much in the extent to which they utilize reference reading assignments. In the general courses in education about six-sevenths of the topics are covered, and in the average special methods courses only one-half of them are covered.

5. There are rather intimate content relationships between educational psychology, technique of teaching, and the eight special methods, observation, and practice teaching courses.

6. Special methods courses vary much in the type of content included, in the comprehensiveness with which they treat this content, in the amount of time devoted to similar or identical topics, and in the extent of use of reference reading assignments.

7. Alumni rank the required courses in education for practical, theoretic, and general, all around, helpfulness as follows:

Rank Order	*Practical Value*	*Theoretic Value*	*General Value*
1	Practice Teaching	Ed. Psychology	Practice Teaching
2	Special Methods	Ed. Sociology	Special Methods
3	Ed. Psychology	The High School	Ed. Psychology
4	Tech. of H. S. Instruc.	Special Methods	Tech. of H. S. Instruc.
5	The High School	History of Ed.	The High School
6	Ed. Sociology	Tech. of H. S. Instruc.	Ed. Sociology
7	History of Ed.	Practice Teaching	History of Ed.

8. The general training program is most adequate in academic subject matter, nearly as adequate in educational theory, and much less adequate in the technical aspects of teaching. It is considered very inadequate in all three phases for the non-major teaching fields, in which 43 percent of the teaching load of these beginners was located.

9. The outstanding problems of the teachers canvassed are related almost entirely to their instructional and professional activities. A professional curriculum recognizing them will have to emphasize, in order of the frequency of occurrence among teachers who have listed problems: discipline; types of classroom teaching, including the project-problem techniques; motivation, interest and effort; classroom management; individual differences; elements of success and failure; lesson planning; understanding high-school pupils; auxiliary teaching aids and devices; marks and marking systems; course of study problems; the assignment; questioning; certain teacher problems as distinguished from teaching problems; socialization of recitation procedures; administrative activities; tests, measurements, examinations; extra-curricular activities; use of the text; etc.

10. A majority of alumni have offered, *voluntarily*, comments or suggestions for the improvements of courses in education as follows: that the training received is helpful; that they consider the program heavy in general instruction and short in specific training; that there is overlapping and duplication. Nearly one-half of them suggest combination of general courses in education. Many types of criticisms are launched against the history of education.

11. Topics are more often checked for possessing theoretic value than practical value. The median practical value of topic treatments to alumni is 24 percent; in theoretic value the median is 33 percent. The median index of functioning value lies at 58 in a range which extends from 3 to 159.

12. Content most often suggested for omission belongs to the following categories: historical topics, predominatingly; also administrative and technical topics.

13. Regarding many aspects of the training program, alumni show reliability and very definite trends of thinking in their composite judgments.

SOME CONSTRUCTIVE PROPOSALS

It was suggested that before the number of hours in education are increased to provide more adequate professional training, much can be done by increasing the functional level within present credit limits by elimination of the least worth while units and through the more adequate emphasis of inadequately treated content. Other recommendations made proposed greater development and standardization of special methods courses, specialization in two teaching fields, the elimination of duplication, the improvement of articulation, less emphasis upon the historical method of educational orientation, and as much specific technical training as possible. A revised professional training program was proposed.

In conclusion, we should state that within the limit of this summary it has only been possible to touch some high spots in order to give a general notion of the rather extensive procedure used and the kind of findings which resulted. The entire study comprises six volumes of which five are tabulations for the use of local instructors.

THE PERFORMANCE OF PRE-SCHOOL CHILDREN OF DIFFERENT SOCIAL GROUPS ON THE KUHLMAN-BINET TESTS

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THE results of many separate investigations have shown that individuals coming from the upper social or industrial classes greatly exceed those coming from the lower classes in average performance on practically any of the recognized tests of intellectual capacity. The results of the army intelligence tests[1] have frequently been quoted. Equally marked differences of a similar nature have been found to exist among school children by Haggerty and Nash[2], Dexter[3], Duff and Thomson[4] and others. A recent study by one of the writers[5] shows that intellectual differences between social classes appear to be as well defined among children of pre-school age as among older children or adults. This study was based upon a socially heterogeneous group of 380 children between the ages of eighteen and fifty-four months, all of whom were given the Kuhlman Revision of the Binet tests twice with an average interval of six weeks between the two examinations. The children were divided into six groups according to paternal occupation. These groups may be classified as follows:

Group I. Professional. (Doctors, lawyers, teachers, etc.)
Group II. Semi-professional and managerial. (Accountants, draftsmen, factory owners, and superintendents, etc.)
Group III. Clerical, skilled trades, and minor business. (Clerks, traveling salesmen, electricians, mechanics, retail dealers, etc.)
Group IV. Semi-skilled trades and minor clerical. (Blacksmiths, boiler makers, mail carriers, etc.)
Group V. Slightly skilled workers. (Janitors, truck drivers, etc.)
Group VI. Unskilled laborers.

The results of the tests show a consistent and fairly regular decrease in the mean IQ of the children as we go down the scale of occupational

[1] *Memoirs*, National Academy of Sciences, 1921, XV, Part 3.
[2] Haggerty, M. E. and Nash, H. B. "Mental Capacity of Children and Paternal Occupation." *Journal of Educational Psychology*, XV (1924), 539-572.
[3] Dexter, Emily S. "The Relation between Occupation of Parent and Intelligence of Children." *School of Society*. XVII (1923), 612-614.
[4] Duff, J. F. and Thomson, G. H. "The Social and Geographical Distribution of Intelligence in Northumberland." *British Journal of Psychology*, XIV (1923), 192-198.
[5] Goodenough, Florence L. "The Relation of the Intelligence of Pre-school Children to the Occupation of their Fathers." *American Journal of Psychology*, XL (1928), 289-299.

classes. On the first of the two examinations given, the difference in the mean IQ of the children belonging to Group I and the corresponding figure for Group VI amounted to slightly more than one and one-fourth standard deviations of the entire distribution for the group as a whole. On the second examination, which it has been elsewhere shown[6] was the more reliable of the two, the difference was even greater, amounting to over one and six-tenths standard deviations. Whatever may be the factors underlying the relationship between social class and intelligence test score, they appear to be as effective during very early childhood as in later life.

The question then arises whether the relatively poor performance of the children in the lower social groups is manifested equally with respect to all of the various kinds of tasks included in the scale used, or whether these children are characterized, not simply by a somewhat lower general level of ability but also by a difference in the profile or pattern of abilities which is exhibited at any given developmental level. The point has some theoretical significance, since it may have a bearing not only upon the origin of individual differences in mental ability, but also upon the general nature of intelligence and the possibility of its modification through training.

It was therefore thought worth while to consider the data obtained from the study of pre-school children previously mentioned, not simply with reference to total performance on the scale as a whole, but also with regard to the comparative performance of children from different social backgrounds on the separate parts or items of the scale. In order to secure the reliability of greater numbers, ninety-five additional cases of corresponding age and social distribution who had been given one examination, but who, for one or another reason, could not be recalled for a second examination, have been included together with the 380 cases upon which the previous study was based. Since the purpose of the present study is to compare developmental patterns rather than developmental rates or levels, the children have been classified according to mental age rather than chronological age, thus making it possible to determine whether reliable differences exist between the different social classes with respect to pattern of performance when the total level of performance is held equal.

[6] Goodenough, Florence L. *The Kuhlman-Binet Tests for Children of Pre-school Age. A Critical Study and Evaluation.* University of Minnesota Institute of Child Welfare Monograph Series No. 2, 1927.

The children have therefore been divided into two groups, which will, for convenience, be called Group A and Group B. Group A includes all children from occupational classes I, II, and III; Group B includes those of classes IV, V, and VI. Since the mean IQ for the total group fell between the means for classes III and IV on both examinations, it is seen that Group A includes those occupational classes whose intellectual average was found to be above that for the population in general, while Group B includes the occupational groups which ranked below the general average. Table I shows the distribution of cases within each group according to mental age earned on each of the two examinations given. It will be recalled that these examinations were separated by a six-week interval.

TABLE I

DISTRIBUTION OF CASES WITHIN THE TWO SOCIAL GROUPS ACCORDING TO MENTAL AGE

MENTAL AGE	1-6 to 1-11.5	2-0 to 2-5.5	2-6 to 2-11.5	3-0 to 3-5.5	3-6 to 3-11.5	4-0 to 4-5.5	4-6 to 4-11.5	5-0 to 5-5.5	5-6 to 5-11.5	6-0 to 6-5.5
First examination										
Group A	33	40	37	29	27	37	31	14	5	3
Group B	35	40	44	34	16	20	12	11	7	0
Second examination										
Group A	20	30	26	24	13	25	31	26	16	7
Group B	20	31	31	21	10	15	15	15	4	0

It is seen that Group A includes three cases at the time of the first examination and seven at the time of the second examination whose mental ages fall within a higher class interval than do any of the cases in Group B. These cases have been disregarded in working up the data. The results for the first examination are accordingly based upon 253 cases in Group A and 219 in Group B, or 472 in all; those for the second examination are based upon 211 cases in Group A and 162 in Group B or 373 in all.

The results were tabulated to show the percentage of each group succeeding with each test in the scale at successive mental-age levels. The number of cases in many of the groups is so small that a considerable degree of irregularity is to be expected upon the basis of chance, and such irregularities were found to exist. Some method of grouping the data appeared, therefore, to be essential if any reliable general tendencies were to be brought out.

In our present state of ignorance regarding the psychological functions underlying any form of behavior, it would be difficult if not impossible to decide upon any system of classification which would meet

with universal approval. We decided, therefore, to adopt the classification used by Gesell.[7] Gesell divides the tests into four groups: tests of motor development, tests of acquired information (which he includes as a sub-class under his group of tests of personal-social development), tests of language development, and tests of adaptive behavior. The data were treated in two ways. In the first place, the total percentage in each of the two social groups who passed each of the tests was computed, neglecting those age groups in which both Group A and Group B had scored either complete success or failure. The differences between the two percentages thus obtained were then divided by the standard errors of those differences. As a further check upon the reliability of these differences, the consistency of superiority of the group showing the higher percentage of success was indicated by showing in what proportion of the age groups included within the developmental curve for that test the difference is in favor of the group earning the higher total percentage of success. The results obtained by both methods have been summarized in Table II.

Examination of Table II brings out several interesting points. Although variations due to the small number of cases occur with such frequency that but little confidence can be placed in the outcome for any single test, certain general tendencies are apparent when the groups of tests are compared. On the four motor tests, Group B is superior in total percentage passing for six out of the eight determinations on the two examinations. Considering the age group separately, and again combining the results for the four tests and the two examinations, we find that Group A is superior in ten of thirty-six half-year mental age groups, Group B in twenty-four, while in two instances the percentages are equal. It should be remembered that since the groups were paired on the basis of mental age, the average chronological age of the children in Group B is greater than of those in Group A. Their greater physical maturity is presumably one of the factors which contributes to their relatively superior performance on this group of tests.

The greatest superiority of Group A is shown on the language tests. Only one of the thirteen tests shows a superiority of Group B on both examinations, and this apparent superiority is due to the exceptional performance of a single age group. Eight of the thirteen tests show a superiority of Group A on both examinations. When the direction of

[7] Gesell, Arnold. *The Mental Growth of the Pre-school Child.* New York: The Macmillan Co., 1925.

TABLE II

Comparative Performance of the Two Social Groups on the Separate Tests

Year	Test	Description	Examination 1			Examination 2		
			Superior group	$\frac{\text{diff}}{\sigma \text{ diff}}$	Consistency	Superior group	$\frac{\text{diff}}{\sigma \text{ diff}}$	Consistency
		Group A, "Motor" Tests						
2	4	Copying a circle	B	1.99	Each of 3 age groups	B	2.31	Each of 3 age groups
3	8	Tracing a square	A	2.18	2 of 5 age groups	B	0.26	4 of 5 age groups
4	5	Tracing an irregular form	B	0.36	3 of 6 age groups	A	1.57	2 of 6 age groups
5	2	Copying a square	B	0.93	1 of 3 age groups	B	0.98	3 of 4 age groups
		Group B, Tests of Acquired Information (Included under "personal-social behavior" in Gesell's list)						
3	2	Pointing out parts of body	B	0.52	2 of 3 age groups	A	0.95	2 of 4 age groups
3	3	Giving the family name	A	1.99	4 of 5 age groups	A	1.60	3 of 6 age groups
4	1	Giving sex	A	2.29	4 of 6 age groups	A	1.88	2 of 6 age groups
5	8	Naming the primary colors	B	0.31	3 of 6 age groups	A	0.43	2 of 5 age groups
6	1	Distinguishing right and left	A	1.06	5 of 6 age groups	B	1.21	Each of 5 age groups
6	3	Distinguishing morning and afternoon	A	0.52	3 of 6 age groups	A	0.51	4 of 5 age groups
7	2	Naming the first four coins	B	2.30	4 of 5 age groups	B	1.36	2 of 3 age groups
		Group C, Language Tests						
2	1	Pointing out objects in pictures	A	0.76	1 of 2 age groups	A	1.08	1 of 2 age groups
2	3	Obeying simple commands	B	1.12	1 of 2 age groups	A	0.57	Each of 2 age groups
3	1	Enumeration of objects in pictures	B	1.01	2 of 6 age groups	B	1.31	2 of 4 age groups
3	4	Repetition of a sentence of six syllables	A	0.95	3 of 5 age groups	A	2.58	3 of 5 age groups
3	5	Naming familiar objects	A	1.25	3 of 4 age groups	A	0.56	Each of 3 age groups
3	6	Repeating two numerals	A	0.18	Each of 3 age groups	A	0.80	3 of 6 age groups
4	2	Repeating three numerals	A	1.54	3 of 6 age groups	B	0.35	5 of 6 age groups
4	7	Comprehension	A	2.71	4 of 5 age groups	A	2.10	3 of 6 age groups
5	5	Repetition of a sentence of ten words	A	2.04	5 of 6 age groups	A	2.29	4 of 5 age groups
5	6	Definition according to use	A	2.54	5 of 6 age groups	A	1.18	3 of 5 age groups
7	1	Description of pictures	B	0.29	3 of 5 age groups	A	0.12	2 of 4 age groups
7	4	Repetition of five numerals	B	2.09	3 of 4 age groups	A	2.48	Each of 4 age groups
7	5	Comparing two objects from memory	A	1.73	3 of 4 age groups	A	0.86	3 of 4 age groups

TABLE II—(Continued)

TABLE II—(Continued)

COMPARATIVE PERFORMANCE OF THE TWO SOCIAL GROUPS ON THE SEPARATE TESTS

YEAR	TEST	DESCRIPTION	EXAMINATION 1			EXAMINATION 2		
			Superior group	$\frac{\text{diff}}{\sigma \text{ diff}}$	Consistency	Superior group	$\frac{\text{diff}}{\sigma \text{ diff}}$	Consistency
		Group D, Tests of Adaptive Behavior						
2	2	Imitation of movements	B	0.32	2 of 3 age groups	B	0.70	2 of 3 age groups
2	5	Removal of wrapping from food before eating	B	0.31	Each of 2 age groups	A	0.54	One age group only
3	7	Naming pictures from memory	A	1.68	2 of 5 age groups	A	0.92	3 of 5 age groups
4	3	Comparison of two lines	A	1.93	3 of 6 age groups	A	1.66	3 of 6 age groups
4	4	Discrimination of forms	A	1.94	2 of 5 age groups	A	1.50	2 of 5 age groups
4	6	Recognition of forms	A	0.48	2 of 6 age groups	A	1.27	2 of 6 age groups
4	8	Naming pictures from memory	No difference		B ahead in 5 of 6	B	0.48	2 of 4 age groups
5	1	Counting four pennies	B	0.88	2 of 6 age groups	B	0.41	3 of 5 age groups
5	3	Comparison of weights	B	0.61	3 of 5 age groups	B	0.12	2 of 4 age groups
5	4	Making rectangle with two triangles	A	1.61	5 of 6 age groups	A	2.80	4 of 5 age groups
5	7	Tapping blocks in irregular order	B	1.01	5 of 6 age groups	B	0.94	Each of 4 age groups
6	2	Aesthetic comparison	A	0.38	3 of 6 age groups	A	1.02	3 of 5 age groups
6	4	Recognition of mutilation in pictures	B	1.45	4 of 6 age groups	B	0.13	3 of 5 age groups
6	5	Execution of three simultaneous commands	A	1.91	4 of 6 age groups	A	1.31	3 of 5 age groups
6	7	Folding a square of paper three times	No difference		A ahead 3 of 6 groups	B	0.16	2 of 4 age groups
6	8	Tapping blocks in irregular order	No difference		A ahead 3 of 6 groups	B	0.80	Each of 4 age groups

superiority is considered for the separate age groups, it is found that Group A is superior in sixty-seven instances, Group B in thirty-seven, while the percentages are equal in eleven instances. It should be noted that children with a foreign language handicap have not been included in the study.

No reliable difference is apparent in the pattern of performance of the two groups on either the tests of acquired information or the adaptive behavior tests. There is a suggestion, however, that a larger sampling of items might reveal differences in the type of information most likely to be possessed by each group. For example, the children in Group A appear to be more likely to know the family name and their own sex, while those in Group B do slightly better in naming the coins. Group B also makes a slightly better showing on the tests of adaptive behavior, but this difference is well within the limits of chance.

It must not be forgotten that all these differences are considered as *relative to the total performance of the respective groups.* In no instance is Group B *absolutely* superior to Group A when chronological ages are held equal. Nevertheless, the fact that the developmental superiority of the latter group appears to be much more clearly shown in respect to certain traits than in others appears to indicate that the facts underlying the development of these traits are not entirely similar. It is highly probable that the application of a more adequate sampling of carefully classified tests to groups of young children selected according to various types of contrasted factors such as sex, social status, size of family, presence or absence of playmates of similar age, rural or city residence, etc., would contribute much to our understanding of the nature and origin of individual variations in mentality.

ACHIEVEMENT CURVES AND THEIR TREND THROUGH THE YEAR

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Much has been said and written regarding the distribution curves of achievement, but in all the published material, nothing has been found by the writer which actually gives a statistical analysis of achievement distributions. The present discussion deals with such an analysis—treating achievement not only as a static but as a changing phenomenon. The class concerned is one of 50 students in Biology in the University High School of the College of Education, University of Minnesota. The social and economic status of the families from which these students come is of a high order. The intelligence quotients were obtained from three to five group tests and two Stanford-Binet tests on each student and reduced to a Stanford-Binet equivalent. The average IQ of these 50 students is 113.300 ± 1.015, the skew is $+.15$, kurtosis is 3.77, coefficient of variation 9.39. These data are given for comparison with the achievement data—the constants will be briefly explained later. When trends are spoken of, it should be remembered that the same, identical 50 students are furnishing the data. The data are scores on 14 objective tests given during the year at approximately two-week intervals. The tests were made up by the writer with every effort at objectivity, adequate length and difficulty. The question types were multiple choice, analogies, and classification for the most part. The scores are point scores, not warped by scaling into theoretically normal distributions. We are making a fetish of the normal (Gaussian) distribution; in truth it is the exception, not the rule, both in IQ and achievement, when classes of ordinary size are considered.

The points of analysis are curve type (Pearsonian), skew, kurtosis (flatness or peakedness), and variation (as shown by the coefficient of variation). No attempt at interpretation in regard to curve-type and causation will be made—only the type and the distance from the normal curve are shown. The constants and their calculation are fully discussed in text-books of statistics—space does not permit of their discussion here further than to say that the Beta constants are calculated from the "moments" of a distribution, a moment being a deviation or a power of

a deviation from the mean multiplied by its frequency. Beta 2 is a measure of kurtosis; skew is calculated from both Beta 1 and Beta 2; curve type is also fixed by the values of both Beta-constants. The coefficient of variation is the standard deviation expressed as a percent of the mean (100 S. D. divided by M), and so is a means of comparison for all distributions. Table I shows the values of these constants for the fourteen tests, numbered in the order as given.

TABLE I

STATISTICAL CONSTANTS OF THE FOURTEEN TESTS

TEST	BETA 1	BETA 2	SKEW	VARIATION
1	.000	2.89	+.01	26.93
2	.004	1.88	—.41	18.66
3	.099	3.03	—.17	25.34
4	.181	3.73	+.17	22.75
5	.108	2.65	—.52	24.84
6	.010	2.73	—.06	24.01
7	.332	2.91	—.48	12.60
8	.014	2.42	+.11	21.02
9	.015	2.39	+.12	18.27
10	.018	2.51	+.11	16.28
11	.003	2.39	—.05	20.16
12	.144	2.19	—.91	19.81
13	.012	2.71	—.07	21.84
14	.021	2.21	+.20	47.05

Figure I is from Pearson's chart of curve types. Curves falling on the line Beta 1=0 are symmetrical, all others are skew. The point Beta 1=0, Beta 2=3 is the normal curve point. This figure and Table I show that test 4 is a Type IV curve, all others are in the area of Type I, though some are close to the Type II line. Test 2 shows an almost rectangular distribution. It might be argued that some of these tests do not differ significantly from the normal as regards their Beta-constants. But we are not now dealing in probabilities—we want the actual distribution curve of the scores of each particular test, not the probable normalness of the population of which the class is a sample. When Beta 2=3, a curve has moderate kurtosis, any value below 3 indicates a flattened distribution. The table and figure show that test 3 is near moderate kurtosis, test 4 is peaked, all others are flatter than normal, some very much so. The tabled values of skew show that it may be either positive or negative, the larger values being negative. The coefficients of variation are all moderately high, test 14 is very high. The point marked T is that of the curve of the sum total of the scores of all of the tests—its distance from the normal is apparent. The point marked Q is the average Stanford-Binet equivalent IQ's of the class—differing also from the normal, and what is more interesting, differing very much from all but one of the achievement curves (test 4).

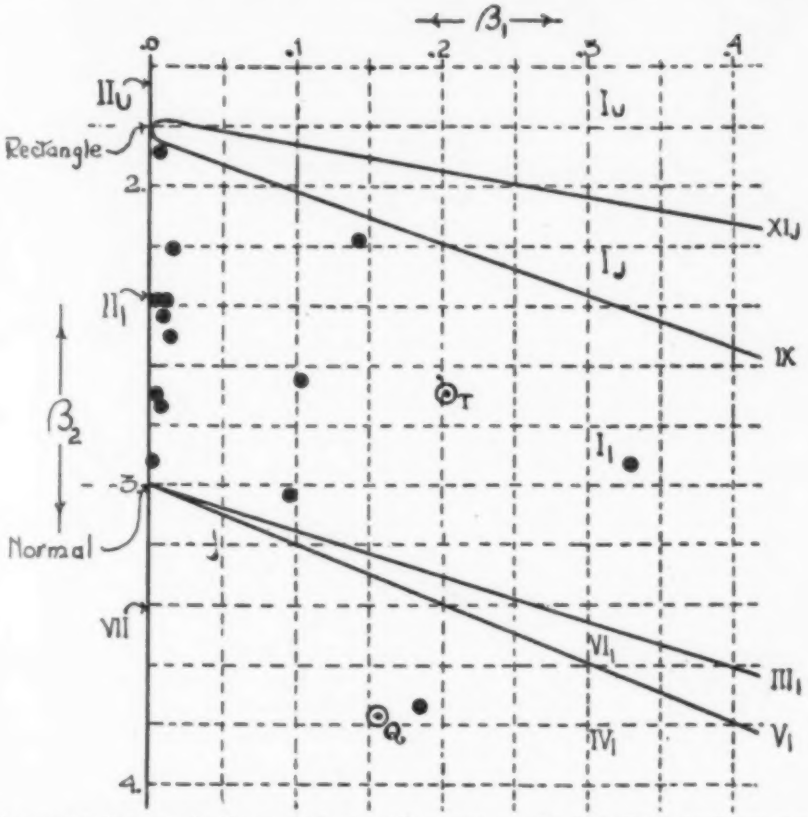

FIGURE I. PEARSON'S CURVE TYPES. All curves on the line Beta 1=0 are symmetrical, all others are skew. Point Beta 1=0, Beta 2=3 is the normal curve. Curves with Beta 2 less than 3 are flatter than normal, more than 3 more peaked than normal.

Figures II, III, and IV show for skew, kurtosis and variation respectively, the comparative relationships between tests, their means, their position relative to their own means and to the normal in the case of skew and kurtosis. Also the trend through the year is shown by the heavy full line, which has been fitted by the method of least squares. On Figure II skew is shown to be more negative than positive with a mean of —.14. The trend is however toward a reduction of the negative skew amounting approximately to a tenth of a standard deviation. It appears that at the beginning of the year some students were very much behind the general body of the class but as the year passed, they reduced the distance separating them from their classmates. This is borne out by

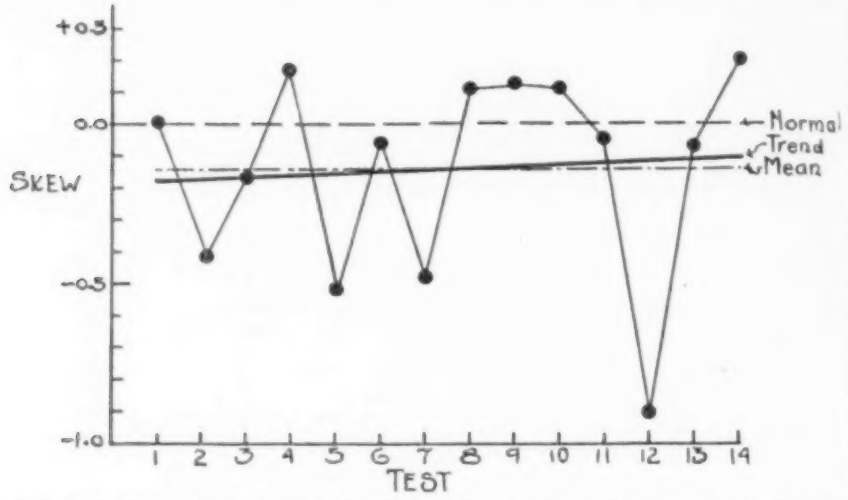

FIGURE II. SKEWNESS. Its relationships and trend through the year, showing the decreasing negative skew.

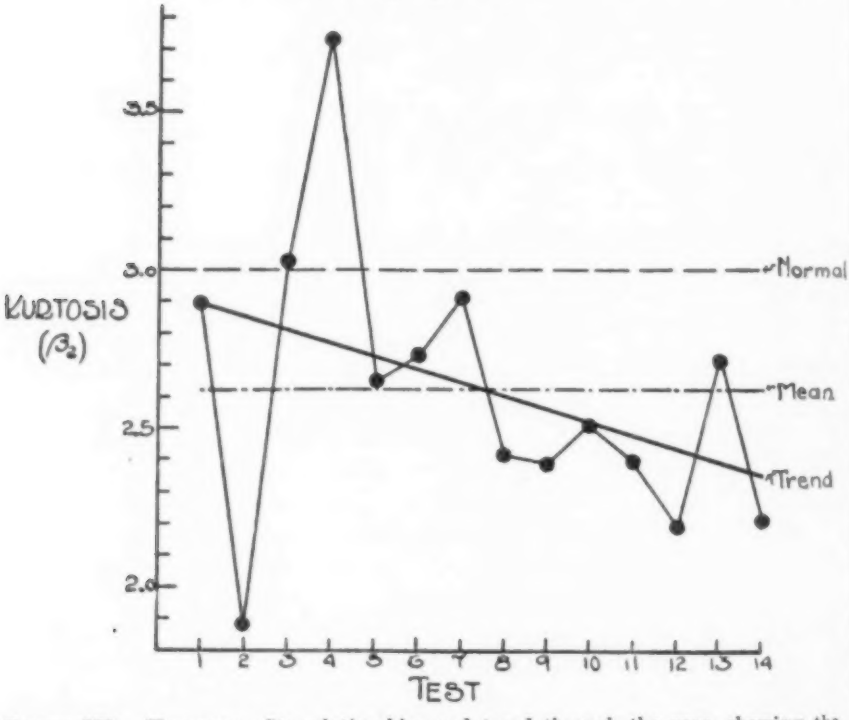

FIGURE III. KURTOSIS. Its relationships and trend through the year, showing the increasing flatness.

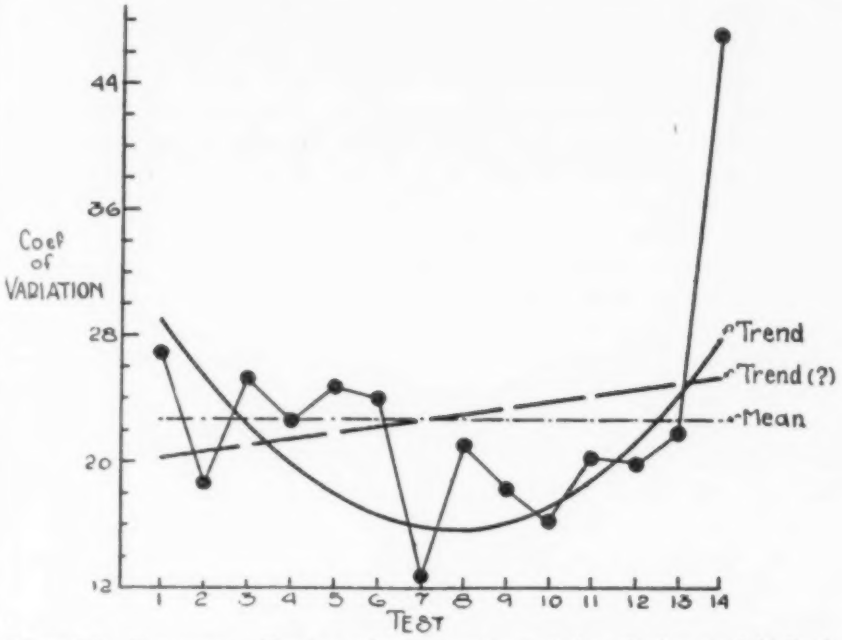

FIGURE IV. VARIATION. Showing either increasing variation (broken straight line), or curvilinear decrease and increase (parabola).

an inspection of the individual scores—it is almost always the same students who trail along at the lower end.

Figure III shows very well the one peaked distribution and the predominance of flatness. The mean is at Beta 2=2.6. The trend through the year is very definitely from flat toward a still greater flatness. The better students seem to be slowly drawing away from the poorer. It seems that it is not that merely a few very good students are outstripping the class for this would result not in flatness but in positive skew. It is a larger group, not only the "best," but the "better" ones that are differentiating themselves, not by outstripping the others, but by slowly creeping ahead.

Figure IV shows the changes in variation. The mean is at 22.8. The trend is difficult to interpret. As shown by the heavy broken straight line the trend is toward a greater variation through the year. But in the tests 1 to 7 the trend seems downward, and in tests 7 to 14 decidedly upward. Accordingly a second degree parabola is fitted as shown by the heavy full line. To compare the closeness of fit the sums of the squares

of the distances of the points from the lines is calculated (in round numbers). The sum of squares from the straight line is 772, from the parabola 588. The curvilinear trend is probably closer to the truth—variation is reduced for a time while skew is being reduced and flatness has not progressed very far, but as flatness increases variation then also increases.

CONCLUSIONS

In the class discussed:

1. The normal (Gaussian) distribution of achievement is the exception.

2. Average skew is negative, and the trend through the year is toward slight reduction of skew.

3. Achievement curves are flatter than the normal; the trend through the year is decidedly toward greater flatness.

4. Variation is moderately high; the trend through the year is first toward a lower variation, then in the latter half toward a higher variation.

5. The distribution of the IQ's of the students concerned is of a positive skew comparable to the higher positive skews of the achievement curves; is more highly peaked than any achievement curve; is of a much lower variation than the achievement distributions; and is not a normal distribution.

A TENTATIVE VOCABULARY FOR FIRST YEAR FRENCH STUDENTS

FLORENCE M. BAKER

THERE are approximately 250,000 words in the French language, hard words, easy words, words that mean little, and words that mean a great deal. How shall we administer them to the young people who pour yearly into the beginning French classes in our high schools and colleges? Shall we use all the words we want and let the students assimilate them as best they can, or shall we select a small number so as to make a balanced diet for growing minds? Let us see by what processes they actually acquire their vocabulary at the present time.

At the beginning of the course students purchase, or are presented with, a book. This book usually contains some reading matter, a lot of grammar, and ample exercises for translating English into French. It has at the back a collection of words varying in number from approximately twelve hundred to fifteen hundred. These words are chosen arbitrarily by the writer of the text-book and rarely conform to those selected by other text-book writers. Indeed, recent studies have shown that the number of words in common is very small. At the beginning of each lesson ten or twelve words appear with their translation, the easier ones presumably being introduced first. The student is sometimes called upon to study these words individually and the first part of the recitation frequently consists of "hearing" them. Later on, if he needs them and finds they are forgotten he looks them up in the vocabulary at the end of the book; and finally, after frequent lapses, a proportion of them find a place in his memory. He observes, too, and with feelings of great pleasure, that a number of words, such as *accent, capable, commence, direction, fortune, immense, permission, plan,* etc., are identical in spelling with their English equivalents and that there are many others, such as *leçon, réponse, ordinaire, mortel, général, grammaire, famille, émotion,* which are very similar. Then there are words ending in *té* which correspond to English words in *ty,* such as *obscurité, variété, nationalité, liberté* and words ending in *age,* which are often identical. He has to learn later that sometimes words which are identical in spelling will have a different connotation in the two languages, but that does not worry him yet. All he knows is that his vocabulary is growing much faster than he had ex-

pected on account of these words. The only drawback is that they are not the ones he wishes most to learn. They are very largely abstract nouns or words that are not greatly in demand. Those that are most needed seem to come very slowly, so that when he tries to write a letter or composition or when he goes abroad he finds it well-nigh impossible to express his simplest needs. Obviously his teachers do not try to withhold the everyday vocabulary from him; it is simply the conditions under which he learns that are the handicap. These conditions are chiefly two; first, the highly literary material of the reading matter is bound to neglect the everyday vocabulary; and, second, the large number of words employed in the text make it impossible to get the necessary drill on any one of them.

In order to get sufficient drill, then, the first thing to do is to reduce the number of words. This will not lessen the supply of words in June but, on the contrary, will increase it, for it will make words *known* instead of simply *familiar*. Many students are equipped largely with the familiar vocabulary. They have lots of words "on the tip of the tongue" but these words never get any farther. They can put them from French into English but not from English into French; the words are simply a passive vocabulary and are of no use in an emergency. We shall some day abandon the idea that exposing the student to a large number of words necessarily means that he acquires a large vocabulary. A large portion of them are simply dead wood and the only purpose they serve is to take his time away from the required drill.

It is probable that a beginning student does not learn more than four hundred words in the first year; that is, in addition to the words which are identical or similar to the English. If conditions are not favorable, he may learn less than this number. By favorable conditions is meant the constant repetition of the word in the text so that it eventually becomes known. If words are to appear over and over in the text there must be fewer of them and it is with this in mind that the list of four hundred words given below is offered as the material for first-year reading.

It is not easy to reduce vocabulary; it is far simpler to write a collection of stories (or one long story) with twelve hundred different words than it is to write with four hundred. But an examination of the Readers in English that are appearing in large number nowadays will show that interesting material can be written with far less than the minimum offered here. It will be claimed that these books are for very young

children. This is true; but it must be remembered that beginning work in a foreign language at any age is comparable to vernacular reading by young children.

How, then, shall we choose these four hundred words? There are a few criteria to aid us in our selection. One of the most popular methods at the present time is the so-called series system. The professor chooses some subject that interests him and he builds, with the aid of a dictionary, a very exhaustive vocabulary. If, for instance, the subject be the human body, a list will be made containing twenty, thirty, or forty words according to the thoroughness of the teacher or the capacity of the pupils. A color list will include every shade in the rainbow and others besides. It may be a furniture list, or clothing, or foods, minerals or textiles, but whatever it is it will be a long and exhaustive array of words. No other type of vocabulary looks more attractive than the series. There they stand, these imposing columns of words, each one representing the alpha to omega of human experience in its own field. But, unfortunately, knowledge arranged in squares and rectangles fits but badly into the irregular convolutions of the human brain. We are not interested in words for themselves but only in so far as they help us to express our thoughts. Words are as vital to our sentences as planks are to a ship, but they are only vital in so far as they fit together. The trouble with these series is that it is well-nigh impossible to weave them together and it is sometimes hard even to weave them in with other words. It is comparatively simple to form a sentence about our head, eyes, or hands; but when we try to talk of our kneecap, thigh, or eyelid, conversation becomes more difficult. The series lists the unusual words with the usual and gives them all the same importance. They take us just as long to learn as words of genuine importance, but they take little or no time to forget for we have no opportunity to practise them.

A far more reliable criterion is that of frequency. A certain number of books are chosen, arbitrarily, by the person making the count. To these are added perhaps newspapers, magazines, letters, and essays. They are all put into a hopper, separated and counted, and finally come out with the list headed by the word that occurs most frequently in the texts, and so on down to those which occur only rarely. It might seem at first glance that this would be a perfect means of acquiring a vocabulary. Simply count off the first four hundred words and there you are. But a further examination of a frequency list will show that it needs a good deal of patching in spots. A perfect frequency list would probably

be possible only after a count of several million words, including a great variety of literature rather than fewer long works. Even then it would probably be too markedly a literary language to form a suitable vocabulary for beginners in a foreign tongue.

The word lists on which this four-hundred-word vocabulary is based are, *The Teacher's Word Book* by E. L. Thorndike and *A French Word Book* by V. A. C. Henmon. The former was made from a count of about four and a half million words, the latter from four hundred thousand, which number is at the present time being increased to about one million. A brief study of both these lists showed that while the first four hundred were desirable and useful words, many of them were of far less importance than others of much lower frequency. The words *éveque, curé, cellule* (bishop, priest, cell) all occur within the first three hundred of the Henmon list and have a frequency of 110, 200, and 139, respectively, while the word *français* occurs only 53 times, *américain* only six times, and the French for *ink, butter, fork, spoon,* and *pencil* are not to be found at all. No doubt the more extended count will change the positions of many of these words. It was found, too, that both lists contained more conjunctions, adverbs, and prepositions than were necessary. A beginner in French prefers to speak in short sentences and prefers a rather large proportion of nouns, verbs, and adjectives. It was a simple matter, then, to eliminate the unnecessary words, but it was not so easy to decide which ones should be put in their places. The standard of frequency was abandoned for association.

When certain words belonged to groups already in the list or formed a part of our everyday environment or conversation, they were introduced. Some words belong to a very definite series. The only series recognized in this vocabulary is that in which the words so related have at some time had to be memorized. For the use of such words no apology is offered. The days of the week, the months, and the numbers form units which we had to memorize in our own language and which, naturally, we have to memorize in French. The easiest way, in fact the only way, to learn them is to learn them *all*. So that while the words *Tuesday, Wednesday,* and *Thursday* have a rather low rate in the Thorndike list and do not appear at all in the Henmon list they are to be found here on an equal footing with the other four days. So, too, are the words *fourteen* and *sixteen* which do not appear at all in the two standard word-lists.

Other words may require some explanation for their presence. *Teacher, ink, pencil, chalk,* and *desk* are necessary as forming an important element in class-room conversation and their presence is necessary so that the business of the class can be done in French from the beginning. *Franc, centime,* and *sou* are an integral part of French culture and cannot well be omitted. *Fruit, butter, cake, sugar,* and *salt* were added to fill the rather meager allowance of vocabulary on foods. Where there was a choice between words which seemed about equally important from the view-point of association, the one with the higher frequency was admitted.

The factor of personal opinion entered, of course, into this choice of words by association. To keep this from becoming too important, a brief word count was made from young people's compositions both in English and French. A record was also kept for three years of the words entering into the conversation of the French lessons, not planned conversation lessons, but remarks which arose naturally during the work. These two sources were a great help in deciding what words were in demand. The closing of the list at the end of the four hundredth word is arbitrary, but it was felt that a round number would be easiest to handle in every way and that while a few important words had been omitted a closing was here justified.

The sources from which the words were collected were therefore about half English and half French. The list, however, is given only in French and no translation is offered, since the total number of words would be unequal in the two lists and an English translation could not give the full content of the French list.

à, au, aux	arbre	beau	café
action	argent	beaucoup	car
âge	arriver	bébé	ce, cette, ces
aimer	assez	beurre	ceci
ainsi	attendre	bien	celui, celle
air	aujourd'hui	bientôt	cent
aller	aussi	blanc	centime
alors	automne	bleu	certain
américain	autre	boire	chaise
ami	avant	bon	chambre
an	avec	bouche	chanter
anglais	avoir	bout	chapeau
animal	avril	bras	chaque
août		brun	chat
appeler	bas		chaud
après	bateau	ça, cela	cher

chercher
cheval
cheveux
chez
chien
chose
cinq
cinquante
classe
combien
comme
commencer
comment
comprendre
connaître
corps
côté
cou
coup
coucher
cousin
couteau
craie
crayon
crier
croire
cuiller

dans
de, du, des
décembre
déjà
demain
demander
demeurer
dent
depuis
dernier
deux
devant
devoir
dimanche
dix
doigt
donc
donner
dont
dormir
douze
droit

eau
école
écouter
écrire
elle
en
encore
encre
enfant
enfin
entendre
entre
entrer
envoyer
et
état
été
être
eux

faim
faire
falloir
famille
femme
fenêtre
fermer
février
fille
fils
finir
fleur
fleuve
fois
former
fort
fourchette
franc
français
France
frère
froid
fromage
fruit

garçon
gâteau
gauche
genou
gens
grand

haut
heure
heureux
hier
hiver
homme
huit

ici
il, ils
institutrice

jamais
jambe
janvier
jardin
jaune
je, me, moi
jeudi
jeune
joli
joue
jouer
jour
juillet
juin
jusque

là
laisser
lait
langue
lapin
le, la, les
leçon
lequel
lettre
leur
lever
lieu
lire
lit
livre
loin
long
longtemps
lorsque
lui
lundi
lune

madame
mademoiselle
mai
main
maintenant
mais
maison
manger
manteau
mardi
mars
matin
mauvais
méchant
médecin
meilleur
même
mer
mère
mercredi
mettre
mieux
mille
minute
moins
mois
moment
mon, ma, mes
monde
monsieur

montrer
mot
mourir
mouton

nature
ne
neuf
nez
ni
noir
nom
non
notre
nous
nouveau
novembre
nuit

objet
octobre
œuf
oiseau
on
oncle
onze
oreille
ou
où
oui
ouvrir

pain
papier
par
parce que
parent
parler
partir
pas
passer
pauvre
payer
pays
pendant
pendule
penser
perdre
père
personne
petit
peu
peur
peut-être
pied
place
plein
pleurer
plume
plus
pomme
porte
porter
pour
pourquoi
pouvoir
premier
prendre
près
printemps
professeur
pupitre
puis

quand
quarante
quatorze
quatre
que
quel
quelque
qui
quinze
quoi

raisin
recevoir
regarder
rendre
répondre
rester
revenir
riche
rien
rire
robe
rose
rouge
rue

sans
samedi
savoir
second
seize
sel
semaine
sembler
sens
sept
septembre
seul
seulement
si
six
sœur
soif
soir
soixante
soleil
son, sa, ses
sortir
sou
soulier
sous
souvent
sucre
sur

table
tableau
tant
tante
tasse
tel
temps
terre
tête
tomber
toujours
tour
tout
treize
trente
très
trois
trop
trouver

un, une

vache
vendredi
venir
vert
verre
viande
vie
vieux
ville
vingt
visage
voici
voilà
voir
voix
votre
vouloir
vous
vrai

y
yeux

The following table shows the relation of these words to the Thorndike and the Henmon Word Lists. Half a dozen of them which are counted as belonging to the first five hundred in both lists have really no direct translation in the Thorndike list as their English equivalent is not one, but several, words. Such words are *voici* (here is), *chez* (at the house of), *tant* (so much), etc.; but as the units of which they were made up belong all to the first five hundred it was decided to include them also.

Word List		1st 500	2nd 500	3rd 500	Over 1500 or not in list	Total
Thorndike	No.	273	71	31	25	400
	%	68.3	17.8	7.7	6.2	100
Henmon	No.	273	50	23	54	400
	%	68.3	12.5	5.7	13.5	100

It will be noted that the big majority of the words belong to the first five hundred in both lists. Of the two hundred and seventy-three words used in each case, two hundred and thirty-six are common to each list of five hundred. The relatively large number which show a low frequency in the Henmon list is due probably to small word count and would no doubt be considerably diminished if the French word count were increased in numbers to compare more evenly with the Thorndike list. As Professor Henmon himself says of *The French Word Book*, "The list is fairly constant down to frequencies of twenty-five or oftener."

This four-hundred word vocabulary claims, then, not only to include the material which would be likely to be needed in a first year's acquaintance with a foreign language, but to include it in terms which admit of being repeated constantly until they are learned. These are words which will fit without artificial arrangement into the conversation, reading, or composition. They will also serve to illustrate grammar rules when necessary. This does not, however, claim to be an exclusive list. There is no thought that the student will be expected to see only these words during his first year. There is no reason why he should not use a dictionary, a newspaper, or French in any form in which it offers itself. But it is felt that these are the words on which to concentrate. The rare words, which may be necessary for the individual to express his thoughts and to which he undoubtedly has a right, are of no particular interest to the rest of the students or of any special use to them. There is therefore no reason why such words should even be brought to their attention. But these four hundred words are fundamental; they are of use to any member of the class.

There are three ways in which a student may acquire a French vocabulary; first by the resemblance of words to those in his English vocabulary; secondly, by the appeal certain words have for him individually; and, thirdly, by his constant meeting with the word. The first two methods may be called "picking-up" a vocabulary, the third is *learning* a vocabulary. In French, which is very different from German in this respect, the common words are the hardest. They are not necessarily hardest to spell, they are simply more foreign and therefore they are the ones that need drilling. This is the list on which the teacher should concentrate largely, leaving to the individual pupils the "picking-up" of the extra words. It is from this list that vocabulary tests should be made, as well as reading tests or comprehension tests of any kind. By *learning* words is not meant the study of the individual word. Except in the case of the days, the months and the numbers (all of which are memorizing), words should not be studied out of their context. Not only does such a method fail to fix the exact connotation of the word, but it is very roundabout and costly in time and an unnecessary strain on the memory. The words should be placed in a wide variety of sentences so as to bring out every shade of meaning, and they should be presented aurally as well as visually so as to make the profoundest possible impression.

This list does not claim infallibility. It will not please everyone, in fact it may not please anyone, for each reader will probably find some pet word of his missing. There is little or nothing about Paris fashions to be found here, there is nothing about the League of Nations or Single Tax. It does not claim to make you a real-estate salesman or to help you win an argument with a taxi-driver; but it does claim that the student who really knows these words can enter on his second year of French with the assurance that this vocabulary, combined with the large number of words of Latin origin which he also knows, will enable him to tackle worthwhile prose and get the thought from it without going through the nerve-racking process of looking up words in the dictionary and making drudgery of what should be enjoyment.

THE EARLIEST PUBLIC HIGH-SCHOOL LAW IN CONNECTICUT

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IT is common property among students of secondary education that one of the very earliest legislative acts dealing with public American secondary education was the so-called "old deluder" law of Massachusetts in 1647. This law prescribed a Latin grammar school for each community when the number of families in the community should reach one hundred.[1] It is only less well known that Connecticut copied the Massachusetts law verbatim in 1650.[2] For nearly one hundred and fifty years this Latin grammar-school law was the basis for all secondary-school legislation in the colony of Connecticut. Modifications were made but slowly. Minor changes of wording, spelling, or punctuation were the chief alterations before 1798. Even as late as 1796, when a revision of some of the laws of the colony of Connecticut was made, the chief features concerning curriculum, support and control, teachers and students, of the earlier Latin grammar-school law, were re-enacted.[3]

The Massachusetts high-school law of 1827 has long been recognized as one of the very early high-school laws of the United States.[4] For your consideration I should like to offer the facts known concerning the Connecticut law of 1798; and to point out that this law is a still earlier public high-school law than that of Massachusetts in 1827.[5]

Paragraphs 9, 10, and 11 of the Connecticut law of 1798 read as follows:[6]

"Paragraph 9. Be it further enacted, That any School Society shall have liberty, by a vote of two-thirds of the Inhabitants present in any legal Meeting warned for that purpose, to institute a School of a higher

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[1] Brown, E. E. *The Making of Our Middle Schools.* (New York: Longman's, Green & Co., 1920), pp. 64-65.

[2] *Public Records of the Colony of Connecticut.* (Hartford: Brown and Parsons, 1850), Vol. I, 1636-1665, pp. 520-521 and pp. 554-555.

[3] *Acts and Laws, State of Connecticut, 1796.* (Hartford, printed by Hudson and Goodwin, 1796), p. 372. An act for appointing, encouraging, and supporting schools. Paragraph 5.

[4] Grizzell, E. D. *Origin and Development of the High School in New England Before 1865.* (New York: The Macmillan Co., 1923), p. 124.

[5] Brown, E. E. *The Making of Our Middle Schools.* (New York: Longmans, Green & Co., 1920), p. 352.

[6] *Acts and Laws, State of Connecticut 1798.* (Hartford: Hudson and Goodwin), pp. 481-484. Paragraphs 9-11.

order, for the common benefit of all the Inhabitants, the object of which shall be to perfect the Youth admitted therein in Reading and Penmanship, to instruct them in the Rudiments of English Grammar, in Composition, in Arithmetic and Geography, or, on particular desire, in the Latin and Greek Languages, also in the first principles of Religion and Morality, and in general to form them for usefulness and happiness in the various relations of social life. And to appoint a Committee to manage the general concerns of such school.

"Paragraph 10. Be it further enacted, That no Pupil shall be admitted into the said School except such as have passed through the ordinary course of instruction in the common Schools and shall have attained to such maturity in years and understanding, as to be capable of improvement in said School in the judgment of the Overseers, and shall by them or any three of them be admitted therein: And if at any time, it shall so happen that more Pupils are admitted than can be accommodated or instructed in said School together, they shall be instructed in such course and order as to give all an equal opportunity.

"Paragraph 11. Be it further enacted, That for every Year in which such school shall be supported, such part of the Public Monies, belonging to any district, shall be paid over to the Committee of said School for the use thereof, that the part so paid over, shall be to the remaining part, as the Children from fourteen Years of age and under, actually attending said School for such Year, from said district, are to those who do not attend, computing from four to fourteen Years of age."

That this law was a secondary-school law is indicated by the fact that in Paragraph 10 entrance requirements are explicitly stated. No pupils were to be admitted except such as should have "passed through the ordinary course of instruction in the common schools." Pupils also were to be mature enough to be able to profit by the work given in this higher school. The school also is called, in paragraph 9, a "school of a higher order."

The school being studied was publicly controlled, and at least partially publicly supported. This is demonstrated by paragraph 11 of the law. For the committee in charge is there instructed as to the use of the "public monies" of the district. Paragraph 9 also makes it clear that the governing committee of the school was to be appointed at a public meeting of the district.

That the school hereby permitted was at least a forerunner of the modern public high school, and not a Latin grammar school, is conclusively

demonstrated by the curriculum outlined. The Connecticut school law of 1796 was still a law dealing with the Latin grammar school. But a new school was in the minds of the lawmakers of the colony in 1798. By the terms of the law the main subjects of instruction were English grammar, English composition, arithmetic, and geography. Latin and Greek no longer were the backbone of the curriculum, but were to be taught "on particular desire" only. Reading and penmanship were to be continued in this "school of a higher order" in so far as necessary "to perfect" the youth in these arts. The "first principles of religion and morality" were to have a place in the school also if the district establishing the school so desired.

According to Paragraph 9, a new feature of this school also was that it was to include girls as well as boys. The law states that the school was "for the common benefit of all the inhabitants". This means that a radically new departure was now taking place. For even as late as 1780 the partially public Hopkins Grammar School of New Haven specified in its rules and regulations[7] that girls were debarred from attending there.

By way of summary then, it may be said that the "school of a higher order" permitted in Connecticut as early as 1798, was in a true sense a forerunner of the modern public high school. It was a school for both boys and girls; it was publicly supported, at least in part; it was publicly controlled; its curriculum was liberalized to the degree that Latin and Greek were no longer the whole curriculum, but were to be taught only if specifically demanded by the community. The real work of the school was to be in the vernacular—English grammar and English composition. The importance of this last provision can be realized only when one gets into the spirit of the colonial period, for Latin and Greek were then the languages of educated people in a sense scarcely understandable by the average student of today.

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[7] Grizzell, E. D. *Origin and Development of the High School in New England Before 1865.* (New York: The Macmillan Co., 1923), pp. 15-17.

STATE TAXES FOR PUBLIC SCHOOLS IN MICHIGAN

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AMONG the state taxes specifically levied for the purpose of providing revenues for public schools, none is more widely employed in the United States today than the so-called general property tax. Nevertheless the increasing recognition of the evils universally and inevitably attending this tax, together with the need for greatly increased public revenues have led one state after another to adopt other types of state taxes. Of these the most significant, the most justifiable as well as the most promising are: income taxes, corporation taxes, inheritance taxes, severance taxes and occupation taxes. To this list must be added state taxes upon certain specific commodities and products such as taxes on gasoline and tobacco.

There is scarcely a state in the Union today in which there are not one or more groups definitely working at the problem of formulating new tax policies. As a basis for such work and subsequent legislation there is need of a study of national scope which will show just what types of state taxes are being levied for the sake of providing school revenue. It is the purpose of the writer, who has been carrying on such a study for the past two years to present in a series of brief articles his findings with respect to the types of state taxes levied for public schools in certain typical states.

It is advisable at the outset to call attention to the distinction between *State School Taxes* and *State Taxes for Schools*. The former include taxes which by the terms of the acts creating them are levied specifically to provide school revenue. Under the term *State Taxes for Schools* are included a long list of taxes, the proceeds of which are credited to the general state fund or to some other non-school fund, from which appropriations for public schools are paid.

In some cases, as in that of a recently enacted Mississippi state income tax law, although no mention is made of schools, the history of the act shows that is was passed primarily for the sake of providing school revenues. Another type of state law is that which provides for the levying of state taxes upon certain classes of property and gives to the public schools a prior claim to a portion of the proceeds.

One of the most interesting examples of a state which employs this latter type of tax is Michigan in which (in the year 1925-26) 99 percent

of the proceeds of the state tax on public utilities was devoted to public schools. Before entering upon an account of the state taxes levied for public schools in Michigan, it is necessary to describe briefly the two permanent school funds which have a prior claim upon the proceeds of these taxes.

STATE SCHOOL FUNDS

Michigan maintains two "accounts" or permanent common school funds, known respectively as the primary school fund and the swamp land fund.[1] The primary school fund is the account of proceeds derived chiefly from the sale of 1,067,397 acres of school lands, the same being the aggregate area of the section numbered 16 in each Congressional township granted to Michigan upon her admission as a state into the Union. The Constitution provides that this fund shall be kept as a permanent fund. Nevertheless, the primary school fund does not today represent a productive endowment. All moneys received by the state for the credit of this fund are used for general state purposes, and the amount thus used is added to the state account. The state is pledged to pay 7 percent interest upon this account, whence the fund is often called the "7 percent fund."

In the year 1926, according to the report of the auditor-general, the account of the primary school fund (including the primary escheats fund) amounted to $4,532,927.54.[2] The annual income on this account at 7 percent would be $317,304.93.

The swamp land fund is the account of proceeds derived from the sales of swamp lands granted to the state of Michigan in the year 1850 and in subsequent years. On this account the state pays 5 percent annual interest, whence the fund is commonly called the "5 percent fund." In 1926, the account of the swamp land or 5 percent fund amounted to $986,121.61,[3] and the interest thereon, $49,306.08.[4]

In official reports, the distinction between these two funds is frequently ignored and their combined interest is reported simply as the primary school interest fund. The interest on the primary school interest fund, as well as the interest on the state debt to the agricultural

[1] For a more complete account of the origin of these funds and of the sources provided for their increase, see Swift, F. H., *A History of Public Permanent Common School Funds in the United States.* pp. 312-16.

[2] Michigan Auditor General, *Report*, 1926, p. 24, Table 7.

[3] *Ibid.*

[4] Computed at 5 percent.

college fund, the normal school fund and the university fund, is paid from a fund known as the specific tax fund, and derived from the proceeds of four types of state taxes: (1) taxes on public utilities, (2) taxes on insurance companies, (3) organization and franchise fees, and (4) inheritance taxes, each of which will be considered in turn.

STATE TAXES FOR PUBLIC SCHOOLS

As implied in the immediately preceding paragraph, Michigan levies no state general property tax, nor any other type of state tax, specifically for public schools. Nevertheless, as will appear later, the specific tax fund is used so largely for providing state revenue for public schools that the taxes contributing to this fund may well be regarded as state taxes levied for public schools.

State taxes devoted to public school funds.—By a constitutional amendment adopted in 1909, it was provided that all subjects of taxation now contributing to the primary school interest fund under the present laws shall continue to contribute to this fund, and all taxes from such subjects shall be first applied in paying the interest upon the primary school fund, university fund, and other educational funds in the order herein named, after which the surplus of such moneys shall be added to and become a part of the primary school interest fund.[5]

The effect of this constitutional amendment was to make the specific tax fund, to which the proceeds of the above taxes are credited, the source of the state educational funds. The entire proceeds of the specific tax fund are credited to the various educational funds of the state. Table I, which follows, shows a percentage analysis of (1) the receipts credited to the specific tax fund, and (2) the disbursements made from the specific tax fund to the various state educational funds.

TABLE I

PERCENTAGE ANALYSIS OF RECEIPTS AND DISBURSEMENTS OF THE MICHIGAN SPECIFIC TAX FUND, 1925-26

RECEIPTS[a]		DISBURSEMENTS[b]	
Source	Percent of total	Transferred to interest funds	Percent of total
Public utilities tax	68.7	Primary school	99.0
Insurance companies tax	16.2	Agricultural college	0.6
Inheritance tax	13.0	University	0.3
Organization and franchise fees	2.1	Normal school	0.1
	100.0		100.0

[a] Michigan Auditor General, *Report*, fiscal year 1926, p. 26, Table 16.
[b] *Ibid*, p. 23.

[5] State of Michigan, *General School Laws*, 1911, p. 5.

Public utilities tax.—Taxes are levied annually on public utilities by the state board of assessors. Such taxes are based upon the true cash value of the corporation, and the rate is "the *average rate* of taxation paid by the general properties of the state."[6]

The term "cash value" wherever used in this act shall be held to mean the usual selling price at the place where the property to which the term is applied shall be at the time of assessment, being the price that could be obtained therefor at private sale and not a forced or auction sale.[7]

The true cash value of a corporation is determined by an examination and appraisal of the physical property of the concern and the financial results of operating the property. Examination and appraisal of physical property must of necessity be going on continuously, especially where there is any construction work. To determine the cash value and especially the annual change in value, the state board of assessors requires an annual report giving the complete financial history of the corporation for the year. The state board of assessors in the performance of their task of annually reviewing the valuation of public utility corporations, must analyze and compare these reports, item for item, with the preceding annual reports.

Determination of the average rate.—The state board of assessors determines the average rate of taxation of the general properties of the state, which is the rate to be levied on public utility corporations, in the following manner. The county clerk of each county must make annually a certified report to the state board of assessors, not later than December 1st, showing the amount of ad valorem taxes to be raised in the several municipalities of such county for state, county, municipal, township, school and other purposes; also, a statement of the aggregate valuation of the property in each of the said several municipalities, as taken from the respective assessments rolls, and the equalized valuation of each such municipality.

Each supervisor or assessing officer of each township, city and village of the state, is required to make a report to the state board of assessors of all ad valorem taxes raised in his assessing district for the current year, and of the assessed valuation of real estate and personal property

[6] State Board of Tax Commissioners and State Board of Assessors, *Report*, 1919-20, pp. 11-12.

[7] Michigan General Tax Law; State Board of Tax Commissioners and State Board of Assessors of Michigan, *Report*, 1919-20, pp. 7-8.

upon which such taxes are levied. On the basis of the information contained in the above reports, the state board of assessors determines the average rate of taxation by dividing the total taxes levied on general property of the state by the total assessments of the same, excluding assessments of taxes for special improvements.[8]

As shown in Table I, the tax on public utilities constitutes the greatest source of revenue of the specific tax fund, and consequently of state funds for educational purposes. The types of public utility corporations contributing to the specific tax fund in the year 1926, and the amount received from each class, are shown in Table II.

TABLE II

RECEIPTS FROM TAXES ON PUBLIC UTILITY CORPORATIONS CREDITED TO THE MICHIGAN STATE SPECIFIC TAX FUND, 1925-26[a]

CORPORATIONS		RECEIPTS
Railroad companies		$ 8,891,980.49
Telephone and telegraph companies		2,065,587.23
Car loaning companies		137,830.40
Express companies		44,096.13
	Total	$11,139,494.25

[a] Michigan Auditor General, *Report*, 1926, p. 26, Table 16.

Insurance taxes.—A state tax is imposed upon the gross premiums of casualty and guaranty companies, and fire and life insurance companies. Table III shows the receipts from the proceeds of insurance taxes credited to the specific tax fund for the year 1926.

TABLE III

SPECIFIC TAX FUND RECEIPTS DERIVED FROM INSURANCE TAXES, 1926[a]

CORPORATIONS		RECEIPTS
Life insurance company taxes		$1,408,868.41
Fire insurance company taxes		797,950.35
Casualty and guaranty company taxes		421,190.45
	Total	$2,628,009.21

[a] Michigan Auditor General, *Report*, 1926, p. 236, Table 81.

Organization and franchise fees.—To the specific tax fund are credited organization and franchise fees paid by corporations to the secretary of state for such services as filing, examining and certifying articles of incorporation, filing and examining annual or special reports, certifying to an amendment, franchise privileges, etc. The receipts from such fees credited to the specific tax fund in 1926 amounted to $341,577.86.[9]

[8] The account here given of the method employed in determining the average rate of taxation is based upon that presented in the *Report* of the State Board of Tax Commissioners and State Board of Assessors, 1919-20, pp. 10-12.

[9] Michigan Auditor General, *Report*, p. 26.

Inheritance taxes.—Upon all inherited property not exempted by law, the state imposes an inheritance tax. The proceeds of inheritance taxes are credited to the state specific tax fund, and in the year 1926 added to this fund $2,112,707.83.[10]

State taxes as sources of public school revenue.—In the year 1925-26, the total receipts credited to the specific tax fund amounted to $16,295,779.28. The relative importance of the various classes or types of taxes contributing to the specific tax fund was concisely presented in the percent analysis of receipts shown in Table I. Of this total fund, $125,865.60 was disbursed to meet payments due the agricultural college interest fund, the normal school interest fund, the university fund, a refund to the inheritance tax fund, and a transfer to the general fund; the balance amounting to $16,169,913.68 was credited to the primary school interest fund. Of the sum credited to the primary school interest fund, $365,528.67 was for the purpose of paying the interest due on the primary school or 7 percent fund, and the interest due on the swamp land or 5 percent fund. The balance of the sum credited to the primary school interest fund, amounting to no less than $15,804,385.01 or approximately 98 percent, is credited to the primary school fund, in accordance with the constitutional provision already detailed, which provides that any surplus remaining in the specific tax fund after the interest upon the primary school fund, the university fund and all other educational funds shall have been paid, shall be added to and become a part of the primary school interest fund. The importance, as state sources of public school revenue, of the taxes contributing to the specific tax fund, can be summed up finally and concisely in the statement that this fund is the only source of state revenues for public schools.

[10] Michigan Auditor General, *Report*, 1926, p. 26, Table 16.

A SUPERVISION PROJECT IN MULTIPLICATION

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INTRODUCTION

DURING the first semester of 1924-1925 the writers made a study of errors in simple multiplication. This was done by giving a test consisting of two hundred ten examples to two thousand children in grades 4B to 8A in twelve schools in the city of Milwaukee. Each example was numbered and from the incorrect answers tables were compiled showing the number of times certain examples were missed. The object of this study was to ascertain specific multiplication difficulties and then provide direct remedial measures. During the second semester of 1926-1927, after refining the tests, the experiment was repeated in the above mentioned grades with the aid of the teachers of the Trowbridge Street School.

The first step in the process was to construct test cards. In constructing these cards all multiplication examples involving two and three place digits in the multiplicand and one in the multiplier were listed for the purpose of analyzing pupil difficulties in the simple multiplication process. There are 7920 such examples. These examples are of two types, namely those involving no carrying and those involving carrying. To the first of these (no carrying), the name Series "A" was given, and to the second (carrying), the name Series "B" was given. These two general types were found to consist of forty-two "types of situations". Examples were then selected covering all of the "types of situations" and incorporated into tests known as Diagnostic Multiplication Tests.

TYPES OF SITUATIONS

What is meant by "types of situations" can best be illustrated by the following examples taken from Series "A":

No. 1	4 3 1		No. 1z	4 3 0	
	$\times 2$			$\times 2$	

Type situation 1 differs from 1z in that the latter has a zero as a unit's digit. It therefore constitutes a different "type of situation" for a pupil, if not a new difficulty.

"Types of situations" may be further illustrated by the following examples taken from Series "B":

No. c-1-2 $\begin{array}{r} 499 \\ \times 2 \\ \hline \end{array}$ No. c-8-2 $\begin{array}{r} 499 \\ \times 9 \\ \hline \end{array}$

Type situation c-1-2 differs from c-8-2 in that the former involves the carrying of *one* twice, while the latter involves the carrying of *eight* twice.

CODE OR KEY NUMBERS

The forty-two "types of situations" might properly have been numbered consecutively from 1 to 42, but it would have been impossible for one to remember the "type of situation" represented by each of these numbers. Code or key numbers which would be self-explanatory therefore were decided upon as listed below:

Series A — no carrying
Series B — carrying
z — zero in the unit's place
z′ — zero in the ten's place
z″ — zero in both unit's and ten's places
c — carrying

EXPLANATION OF KEY NUMBERS

All examples under Series "A" were grouped into three general divisions with key numbers ranging from 1 to 3. This meant that there were three general types of multiplication situations or steps in Series "A." Step one included all examples where each partial product was complete, e.g., $\begin{array}{r} 323 \\ \times 3 \\ \hline \end{array}$. This situation was then modified by substituting zero in the unit's place, thus changing the example to $\begin{array}{r} 320 \\ \times 3 \\ \hline \end{array}$. The key number was changed to 1z. A further modification occurred when zero appeared in the ten's place. The example became $\begin{array}{r} 302 \\ \times 3 \\ \hline \end{array}$, and the key number was changed to 1z′. When the example was changed to $\begin{array}{r} 300 \\ \times 3 \\ \hline \end{array}$, the key number was changed to 1z″. Step two had only two key numbers, namely No. 2 and No. 2z. The No. 2 meant that a new situation

was encountered when the ten's digit was so large that when multiplied it gave two places, e.g., $\begin{array}{r} 81 \\ \times\ 8. \\ \hline \end{array}$ A modification of this example was $\begin{array}{r} 80 \\ \times\ 8. \\ \hline \end{array}$ Since z stood for zero in the unit's place, the key number was 2z. The scheme for marking step No. 3 was essentially the same as for step No. 1. An example of this was $\begin{array}{r} 923 \\ \times\ 3. \\ \hline \end{array}$ The key number for this example was No. 3, and it meant that a new situation was encountered when the hundred's digit was so large that when multiplied it gave two places. Throughout all the test and drill sheets z added to a number always indicated zero in the unit's place, z' always indicated zero in the ten's place, and z'' always indicated zero in both the unit's and the ten's places.

In Series "B" the key numbers were just as simple as in Series "A." In Series "B" all key numbers began with the letter "c," which meant "carrying." Wherever this small letter was followed by the figure 1, it indicated that this was a "type of situation" involving the carrying of 1 in one place. An example of this was $\begin{array}{r} 784 \\ \times\ 2. \\ \hline \end{array}$ The key number was c-1. When the example was changed to $\begin{array}{r} 780 \\ \times\ 2, \\ \hline \end{array}$ the key number was changed to c-1z. When the example was changed to $\begin{array}{r} 708 \\ \times\ 2, \\ \hline \end{array}$ the key number was changed to c-1z'. The carrying of a number twice in the same example was indicated in just as simple a manner. If we examine an example like the following, we see that *one* is carried twice $\begin{array}{r} 489 \\ \times\ 2. \\ \hline \end{array}$ The key number for this situation was c-1-2, and was read "carrying of *one* twice." In an example like $\begin{array}{r} 689 \\ \times\ 4, \\ \hline \end{array}$ the key number was c-3-2, and was read "carrying of *three* twice."

DESCRIPTION OF DIAGNOSTIC MULTIPLICATION TESTS

Each test used consisted of three cards, each of which contained one example of each of the forty-two types of situations. This provided one hundred twenty-six examples in each test, the examples being distributed miscellaneously. The window device of a popular set of arithmetic drill cards was used in the construction of these cards (see Figure 1). Above the window, on the reverse side of the card, was placed not only the answer, but also the key number. Each key number designated the type situation the pupil encountered in attempting to solve a particular ex-

OBVERSE

Diagnostic Multiplication Tests

580	800	491	809	49	60
×4	×5	×6	×9	×8	×8
176	906	308	890	611	407
×5	×3	×5	×8	×7	×3
209	21	702	69	609	623
×5	×9	×4	×7	×4	×9
290	39	591	873	800	791
×7	×7	×6	×3	×4	×9
109	29	100	399	599	270
×7	×4	×9	×9	×9	×2
630	290	590	527	201	951
×3	×4	×5	×3	×5	×4
799	399	101	468	390	309
×7	×8	×8	×2	×6	×2

FIGURE 1

ample, and indicated what drill card would give practice in the solution of other examples involving the same "type of situation." Three examples of each "type of situation" were encountered by the pupils, making it possible to determine by the number of times a "type of situation" was missed, whether there was a real difficulty or whether the error was due merely to carelessness.

DESCRIPTION OF MULTIPLICATION DRILLS

In order to provide properly for effective remedial work, forty-two drill cards were devised, each containing ten examples of the desired "type of situation" and numbered according to the identifying key number previously mentioned (see Figure 2).

OBVERSE

Multiplication Practice

Drills

Series—A

No. 1

433	323
×2	×3
212	111
×4	×5
241	322
×2	×3
221	121
×3	×2
11	222
×9	×4

REVERSE

866	969
848	555
482	966
663	242
99	888

FIGURE 2

METHOD

Each teacher gave Test No. 1, made a record of the difficulties encountered by the pupils, and then began remedial work. Individual help was given to each pupil who failed to obtain a perfect score in the first test. After correcting the child's error and showing him how to work the example correctly, the teacher gave him the drill card designed to meet his difficulty. In other words, if a pupil missed an example with c-8 as a key number, his difficulty, in all probability, lay in the fact that he was not able to handle the carrying of *eight*. After explaining the difficulty to the pupil and after working several examples with him, the teacher gave him drill card No. c-8. This card contained ten examples involving the carrying of *eight*. After a pupil had worked the ten examples, he turned the card over and checked his own work.

After pupils who missed examples in Test No. 1 had been given special help, Test No. 2 was given. The object was to note what improvement had been made by those pupils who had been given special help in their specific difficulties. The amount of time between tests should normally be determined by the amount of special help needed in order to help pupils individually, but at the Trowbridge Street School, the time between Test No. 1 and Test No. 2 was arbitrarily set at one week for the purpose of the experiment. During that week teachers spent five half-hour periods, 8:30 to 9:00, in helping those who needed it.

Test No. 2 was given and recorded in the same manner as Test No. 1. After results had been recorded the teacher gave such special help as was necessary for one more week. After two weeks of intensive training upon the correct way of working the examples, pupils experienced little difficulty in passing Test No. 3. The object of that test was to determine how much improvement had been made after two weeks of drill upon the specific situations. Most pupils were able to pass Test No. 3 with 100 percent accuracy.

The object of Test No. 4 was to see what permanent value had resulted from this diagnostic and remedial work. Test No. 4 was therefore given three months later than Test No. 3. During this interval no special drill was given. The detailed results of the four tests are shown in Tables I, II, and III and the bar graph.

TABLE I

RESULTS OF FOUR SUCCESSIVE TESTS IN SIMPLE MULTIPLICATION
TROWBRIDGE STREET SCHOOL, MILWAUKEE, WISCONSIN

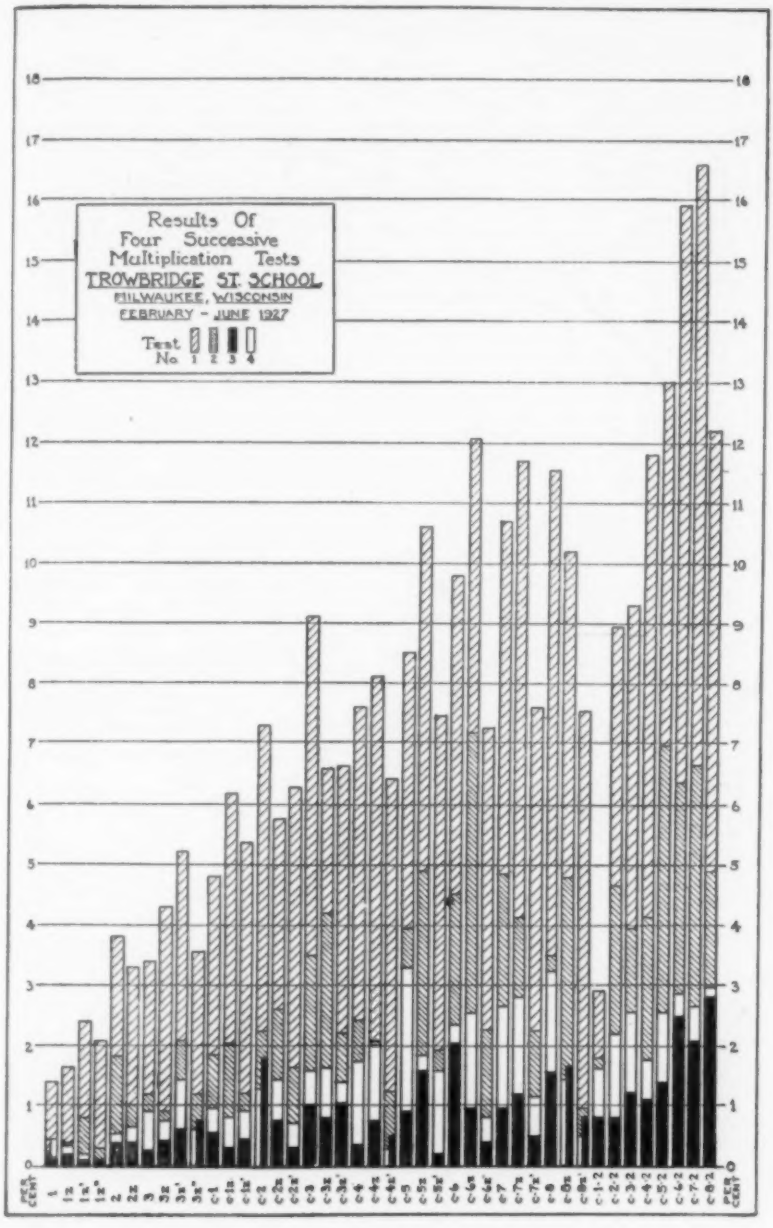
GRADES	NO. OF PUPILS	NO. OF ERRORS POSSIBLE	TEST 1		TEST 2		TEST 3		TEST 4	
			Errors	%	Errors	%	Errors	%	Errors	%
IV	62	7812	1077	13.0	342	4.0	64	0.8	164	2.9
V	79	9954	1343	13.0	332	3.0	44	0.4	150	1.0
VI	85	10710	686	6.0	356	3.0	164	1.5	245	2.0
VII	82	10332	371	3.0	213	2.0	75	0.7	95	0.9
VIII	117	14742	580	3.0	282	2.0	106	0.7	102	0.6
Total	425	53550	4057		1525		453		756	
Average %				7.6		2.8		0.8		1.4

Four hundred twenty-five children in grades 4B to 8A took these tests. Pupils who came to the school after the first test had been given were not included in the report. Pupils who left the school before the experiment was completed were similarly not included.

FINDINGS

Some of the most important findings of the experiment were as follows:

1. Specific drill upon the 42 "types of situations" during special


Results Of
Four Successive
Multiplication Tests
TROWBRIDGE ST. SCHOOL
MILWAUKEE, WISCONSIN
FEBRUARY - JUNE 1927
Test No. 1 2 3 4

help time for two weeks reduced the percent of error from 7.6 percent (first test) to 0.8 percent (third test).

2. There proved to be several zero difficulties instead of one as is commonly accepted. The percent of error in examples with zero in the unit's place was found to be almost always greater than in examples with zero in the ten's place.

TABLE II

NUMBER OF ERRORS IN TEST NO. 1

Code No. of Situations	No. of Examples Missed	Code No. of Situations	No. of Examples Missed	Code No. of Situations	No. of Examples Missed
c-1	59	c-3z′	85	c-6z	155*
c-1z	79*	c-4	97	c-6z′	92
c-1z′	67	c-4z	105*	c-7	137
c-2	99	c-4z′	81	c-7z	151*
c-2z	73*	c-5	106	c-7z′	97
c-2z′	81	c-5z	137*	c-8	150
c-3	118	c-5z′	95	c-8z	131*
c-3z	84*	c-6	120	c-8z′	98

* Zero occurs in unit's place.
Note—The number of possible errors for each situation above was 1275.

3. Certain types of error, especially where zero occurred in the unit's place, persisted even though specific drill had been given.

TABLE III

PERSISTENCE OF ERROR IN TEST NO. 3

Code No. of Situations	No. of Examples Missed	Code No. of Situations	No. of Examples Missed	Code No. of Situations	No. of Examples Missed
c-1	6	c-3z′	12	c-6z	12*
c-1z	3*	c-4	3	c-6z′	4
c-1z′	5	c-4z	9*	c-7	11
c-2	23	c-4z′	6	c-7z	15*
c-2z	11*	c-5	11	c-7z′	5
c-2z′	3	c-5z	20*	c-8	19
c-3	12	c-5z′	1	c-8z	20*
c-3z	9*	c-6	26	c-8z′	10

* Zero occurs in unit's place.
Note—The number of possible errors for each situation above was 1275. Even though equal drill was given on all situations, the number of errors involving zero in the unit's place is still pronounced.

4. The greatest source of error in carrying occurred when the sum of the carried figure and the partial product was in a decade above the partial product as shown by the following example:

$$\begin{array}{r} 8\,8\,1 \\ \times\,7 \\ \hline 7\,1\,6\,7 \end{array}$$

15 added instead of 5.

5. Examples involving carrying were not of equal difficulty. In Test No. 1 the percent of error was 2.88 percent in examples involving the carrying of *one* twice, while the percent of error was 16.58 percent in examples involving the carrying of *eight* twice.

6. Drill upon the specific skills in which pupils were weak yielded larger returns than indiscriminate drill.

7. Indiscriminate drill as previously utilized had been wasteful because pupils used those skills in which they were proficient instead of spending their time upon those in which they were weak.

8. The diagnostic tests revealed the weak skills while the drill cards enabled the teacher to give specific drill upon the specific weakness of each pupil.

9. That forgetting played an important part was proved by the fact that the percent of error increased from 0.8 percent in Test No. 3 to 1.4 percent in Test No. 4. The time between Test No. 3 and Test No. 4 was three months. During this time no specific drill was given.

ADDENDA

Causes of Failure in Multiplication.—While the tests were self-diagnostic and self-corrective as to specific causes, nevertheless a more detailed examination of the results and of oral testing of pupils showed that the failures could be classified under the following general causes:

1. Lack of mastery of higher decade addition. From 45 percent to 55 percent of all errors could be attributed to this cause. An analysis of the errors showed that pupils needed additional drill in the higher addition facts. They frequently added an extra ten as shown in the following example:

$$\begin{array}{r} 890 \\ \times 7 \\ \hline 7230 \end{array}$$

The pupil added 16 instead of 6.

2. Carelessness. From 15 percent to 25 percent of all failures were due to carelessness. The following is an example:

$$\begin{array}{r} 214 \\ \times 2 \\ \hline 828 \end{array}$$

The pupil probably mistook the 2 for a 4.

3. Lack of mastery of combinations. A study of the errors showed that from 5 percent to 15 percent of all errors were due to lack of mastery of the combinations. The following is an example:

$$\begin{array}{r} 809 \\ \times 8 \\ \hline 6471 \end{array}$$

4. Omission of carrying figure. The following is an example:

$$\begin{array}{r} 491 \\ \times\ 5 \\ \hline 2055 \end{array}$$

5. Confusion of number:

e.g.
$$\begin{array}{r} 609 \\ \times\ 6 \\ \hline 5454 \end{array}$$

6. Transposition of figures in writing the product.

e.g.
$$\begin{array}{r} 305 \\ \times\ 3 \\ \hline 951 \end{array}$$

7. Addition instead of multiplication.

e.g.
$$\begin{array}{r} 405 \\ \times\ 5 \\ \hline 2010 \end{array} \qquad \begin{array}{r} 709 \\ \times\ 7 \\ \hline 1463 \end{array}$$

8. Disregard of 0 entirely when in the ten's place.

e.g.
$$\begin{array}{r} 701 \\ \times\ 5 \\ \hline 355 \end{array} \qquad \begin{array}{r} 204 \\ \times\ 2 \\ \hline 48 \end{array} \qquad \begin{array}{r} 205 \\ \times\ 3 \\ \hline 615 \end{array}$$

In the example $\begin{array}{r} 205 \\ \times\ 3 \\ \hline \end{array}$ this difficulty was not discovered. In the examples $\begin{array}{r} 701 \\ \times\ 5 \\ \hline \end{array}$ and $\begin{array}{r} 204 \\ \times\ 2 \\ \hline \end{array}$, however, it was readily seen that the pupil ignored the 0.

EDITORIALS

HOW CAN THE JOURNAL OF EDUCATIONAL RESEARCH BEST SERVE ITS READERS?

At the opening of the present school year, a questionnaire was sent to readers of the *Journal of Educational Research* to secure the reader's point of view relative to certain matters of editorial policy. One hundred and fifty usable replies were received to this questionnaire. The tables which follow present a tabulation of the data contained therein. While the data represent a rather limited sampling of the larger group of readers to which the *Journal* is addressed, they seem to present, however, some agreement as to matters of policy.

TABLE I

AN ANALYSIS OF THE POSITIONS (INCLUDING CHARACTER OF THEIR WORK) HELD BY THOSE REPLYING TO THE QUESTIONNAIRE

	Positions	Number Received
I.	Public Schools	
	1. Superintendents	53
	2. Principals	14
	3. Directors of Research	11
	4. Supervisors of Instruction	6
	5. Teachers	1
II.	Colleges and Universities	
	1. Administrative Officials	5
	2. Instructors	44
	3. Directors of Bureaus of Research	5
III.	State Departments	2
IV.	Miscellaneous Positions	9
V.	Total	150

TABLE II

A TABULATION OF THE RETURNS FOR QUESTIONS ONE TO FOUR RELATIVE TO EDITORIAL POLICY

	Yes	No
1. Should the *Journal of Educational Research* aim definitely to modify school practice? (To do so, would probably mean that the *Journal* should attempt to serve teachers, principals, supervisors, and superintendents, who are interested in the application of scientific methods to school problems.)	117	18
2. Do you think that a journal of research might be more scientific and less technical? (It has been suggested that the readers want not less science, but more care exercised in making the descriptive and interpretative portions understandable to teach-	120	12

ers, principals, supervisors, superintendents, etc., those not trained in technical research.)

3. As a contributor to the *Journal of Educational Research*, do you prefer to write: (1) for the research specialist alone, or (2) for teachers, principals, supervisors, and superintendents interested in scientific education, or (3) comprehensively enough to interest both groups?	(Indicate which) (1) 5 (2) 41	(3) 70
4. Should reports of research be published which seem to follow a reasonably sound experimental technique but which are based upon a relatively small number of cases, or seem preliminary in character or not sufficiently conclusive to serve as a basis upon which to modify school practice? (A superintendent of schools recently remarked that he did not object to the reading of technical articles—as a matter of fact he preferred them—but he did object to spending an hour or more working through such an article to find in the end it led nowhere, that is, led nowhere from his point of view.)	Yes 54	No 65

TABLE III

A TABULATION OF THE RETURNS IN ANSWER TO THE QUESTION: IS THERE ANY ONE FIELD TO WHICH THE JOURNAL MIGHT WELL GIVE SPECIAL ATTENTION DURING THE COMING YEAR?

	FIELD	NUMBER OF TIMES MENTIONED
1.	Curriculum Research	42
2.	Experimental Studies of Teaching and Learning	74
3.	Measurements Applied to Character Education	43
4.	Guidance	34
5.	Child Study	19
6.	Special Education	13
7.	Supervision	52
8.	Administration	40

TABLE IV

SOME TYPICAL COMMENTS ON MATTERS OF EDITORIAL POLICY

1. Could not each article be abstracted by the editorial board and the abstract printed after the article?
2. I have been a subscriber from the beginning and I think the present policy should be continued.
3. There should be enough technical material to enable the reader to evaluate the article.
4. Why not dig into college teaching?
5. I have found the *Journal of Educational Research* very helpful.
6. I suggest that articles based upon opinion and non-objective data be omitted.
7. I recommend more attention to problems of higher education.
8. There might well be an occasional article summarizing the results of experimentation in a given aspect of teaching.
9. I think the *Journal of Educational Research* should remain the outstanding publication devoted purely to research.
10. More attention should be given to the description of experimental techniques.
11. The *Journal* has been very satisfactory.
12. Articles are too technical; publish no article without a good summary at the end.
13. I should not like to see the *Journal* become a yearbook. We have enough of them.
14. Eliminate as much of the "high-brow" statistics as possible.
15. Research workers are not reaching the mass now. They are writing for each other.

16. I do not believe that research can be reported except in a technical way.
17. Why not publish complete reports for specialists and summaries for the general teaching public?
18. Satisfactory as it has been.
19. To popularize the *Journal* would be a step backward.
20. The title of the *Journal* suggests genuine research: it may serve either technical worker or field workers. Both are worthy purposes.
21. The *Jounal* should attempt to live up to the ideals of research presented by Whipple in his article: "The Improvement of Educational Research." *School and Society*, August 27, 1925.

A. S. B.

AN INCIDENT RECORDED IN 1858

From Emerson's *The Adirondacs*—a journal of the experiences of ten professional men of research in the realms of science, including the conduct of human as well as of nature life, when camping in a wild lake region of the Adirondacs. The incident here quoted concerns their action and reaction on news that the first Atlantic cable was completed.

"With a vermilion pencil mark the day
When of our little fleet, three cruising skiffs
Entering Big Tupper, bound for the foaming Falls
Of loud Bog River, suddenly confront
Two of our mates returning with swift oars.
One held a printed journal waving high
Caught from a late-arriving traveller,
Big with great news, and shouted the report
For which the world had waited, now firm fact,
Of the wire-cable laid beneath the sea,
And landed on our coast, and pulsating
With ductile fire. Loud, exulting cries,
From boat to boat, and to the echoes round,
Greet the glad miracle. Thought's new-found path
Shall supplement henceforth all trodden ways,
Match God's equator with a zone of art,
And lift man's public action to a height
Worthy the enormous cloud of witnesses,
When linked hemispheres attest his deed.

* * * * * * * * * *
* * * * * * * * * *

A spasm throbbing through the pedestals
Of Alp and Andes, isle and continent
Urging astonished Chaos with a thrill
To be a brain, or serve the brain of man.

The lightning has run masterless too long;
He must to school and learn his verb and noun
And teach his nimbleness to earn his wage,
Spelling with guided tongue man's messages
Shot through the weltering pit of the salt sea.

And yet I marked, even in the manly joy
Of our great-hearted Doctor in his boat
(Perchance I erred), a shade of discontent;
Or was it for mankind a generous shame,
As of a luck not quite legitimate,
Since fortune snatched from wit the lion's part?
Was it a college pique of town and gown,
As one within whose memory it burned
That not academicians, but some lout,
Found ten years since the Californian gold?
And now, again, a hungry company
Of traders, led by corporate sons of trade,
Perversely borrowing from the shop the tools
Of science, not from the philosophers,
Had won the brightest laurel of all time.
'Twas always thus, and will be; hand and head
Are ever rivals: but, though this be swift,
The other slow,—this the Prometheus,
And that the Jove,—yet, howsoever hid,
It was from Jove the other stole his fire,
And, without Jove, the good had never been."

REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

STAFFORD, GEORGE T. *Preventive and Corrective Physical Education.* New York: A. S. Barnes and Company, 1928. 328 pages.

A phase of Health and Physical Education which is being given increased attention is the prevention and correction of defects. In this book the writer has covered very thoroughly the fundamentals of such topics as; physiotherapy, physiology of exercise, body mechanics, malnutrition, constipation and visceroptosis, infantile paralysis and spastic paralysis, together with a discussion of pathological conditions of the heart and feet. An entire chapter is devoted to athletic injuries. The book is carefully written and well illustrated.

The writer has given considerable thought to the proper relationship of athletics to the broader program of physical education. He points out that true education provides opportunities for improvement of the mass of students through adaptation of materials and methods to individual needs, whereas in athletics only those persons are selected whose achievements are far superior to the average of the group.

Results of the draft are quoted as evidence that increased attention should be given to corrective exercises. He further states, "only by graduated exercises did those poorly developed and organically weak individuals develop into more vigorous and healthier men." It is possible that the author has made too extensive claims here since a careful survey or draft statistics show that most of the defects found could hardly have been prevented or corrected by exercise either of a group or individual nature. Moreover it would be difficult to prove that graduated exercise alone was responsible for developing those soldiers who were physically inferior. It is just as reasonable to assume that proper diet, coupled with better habits of personal health and community hygiene were of great significance in bringing about this improved physical condition.

On the whole, however, the book is an excellent presentation of the preventive and corrective aspects of health and physical education. It will serve as a valuable text in teacher training institutions preparing specialists in this field.

C. L. BROWNELL
Ohio State Department of Education

WAPLES, DOUGLAS AND OTHERS. *Problem Exercises for High School Teachers.* Chicago: University of Chicago Press, 1928. x + 99 pages.

This book contains six tests based upon typical problems in junior and senior high-school teaching. These tests are as follows: General Methods, English Literature, English Composition, Social Studies, Mathematics, and Natural Science. Each test consists of ten problem-situations. For each problem-situation five possible solutions are proposed. The teacher is directed to indicate which of the possible solutions is most satis-

factory and which is least satisfactory. The test in General Methods contains problem-situations involving the following: Introducing the Course, Directing Study, Applying Incentives, Establishing Authority, Selecting Subject Matter, Developing Appreciation, Teaching Pupils to Think, Improving Study Habits, Constructing Tests, and Reviewing. The test for teachers of Mathematics includes Motivating Study of a Topic, Teaching the Meaning of Mathematical Terms, Teaching a Principle in Algebra, Teaching a Proof in Geometry, Supervising Study, Making Assignments, Teaching a Class to Review, and Testing Understanding of the Unit.

These problem exercises should be valuable for teachers in training and teachers in service. They are very suggestive of a type of test that can be used to great advantage by state departments of education and other examining and certificating agencies, by superintendents of schools in selecting teachers, and by junior and senior high-school principals in various supervisory ways. As a teaching device the present volume could be improved by including a select list of references in connection with each of the sixty problem-situations.

D. H. EIKENBERRY
Ohio State University

CRAWFORD, CLAUDE C. *The Technique of Research in Education.*. Los Angeles: The University of Southern California, 1928. 320 p.

This volume, which is designed as a text for senior or graduate students, represents an attempt to apply the principles of "scientific" curriculum construction to the field of educational research. The author collected from graduate students and from other persons in contact with research work 145 difficulties. The methods of solving these difficulties make up the content of the book. This procedure suggests that the book is a source to which graduate students and others may turn for assistance in dealing with the difficulties that may be encountered in educational research. Unfortunately this does not seem to be the case. For the most part the discussions of these difficulties are too general and too abbreviated to afford much assistance. In places the discussion does pertain to research techniques. For example, "questionnaire technique" is the title of a chapter of ten pages. Seventeen topics are treated, but some of them do not represent difficulties. The space allotted to this review prohibits a detailed evolution but in the judgment of the reviewer the treatment is distinctly inadequate and lacking in effectiveness. There are no illustrations of questionnaires, either good or bad. There is no reference to the heading of a questionnaire. Some of the advice does not seem to be sound. The author advises that the questionnaire be multigraphed rather than printed or mimeographed. The reviewer cannot agree with this advice.

Several of the other chapters are subject to the same criticism. The chapter on "tabular and graphic technique" does not contain a single illustrative table or graph. In some instances the author appears not to be informed in regard to available references. He advises graduates to look over lists of the titles of graduate theses but makes no reference to the compilations of titles which have been issued by the Bureau of Educational Research of the University of Illinois during the past ten years. The documentation of the text is practically nil. This fact is probably significant. In a text having the purpose announced for this one, the absence of documentation can be explained only by the failure of the author to give proper credit to

previous writers or by the inadequacy of the treatment. In this case the second explanation appears to be the true one. In passing it may be pointed out that in respect to documentation this volume is very unlike Good's *How to do Research in Education*. Crawford includes chapter bibliographies, but they are relatively short.

The form of the book is subject to criticism, especially the form of the references. In the chapter on "reporting research" Crawford criticises the omission of essential information from a reference. Examination of the references he gives shows many omissions. On page 65 the place, publisher and date are omitted. On page 40 no author is given. Even in the chapter bibliographies the information is not complete in several instances.

Although in the reviewer's judgment the faults of this book outweigh its merits, it represents an effort to meet an urgent need. In the absence of a comprehensive and critical exposition of research techniques, it will doubtless provide some assistance to graduate students in education.

WALTER S. MONROE
University of Illinois

KLAIN, ZORA, *Educational Activities of New England Quakers; A Source Book*. Philadelphia: Westbrook Publishing Co., 1928. 228 pp.

Through the scholarly labors of Professor Thomas Woody and the students whom he is training, we are gradually acquiring the basic materials for a study of Quaker education. Professor Woody has already issued two collections of sources dealing with Quaker educational activities in Pennsylvania and in New Jersey. Dr. Klain, who several years ago published an informing work on *Quaker Contributions to Education in North Carolina* now follows it with a source book on Quaker education in New England.

The present volume is divided into four parts. The first reviews the history of Quaker education from the beginnings in the seventeenth century to the end of the nineteenth; the second and third present original records of the schools and of the action taken by "Meetings" and committees in relation to schools; and the fourth part displays the records of the educational philanthropy of the New England Quakers, a philanthropy extended more particularly to the negroes and the Indians. The materials for this book were culled from several hundred manuscript volumes of minutes of the various "Meetings" and from a variety of newspaper and other printed sources. The book eloquently testifies to the industry of the compiler.

Many problems in our educational history have new or added light thrown upon them by this work. We shall name only two. Quakers, like other sects, at various times received public aid for private schools. This book furnishes data for a more complete answer to the question: To what extent have private schools received public support and what have the consequences been? And in the second place, Quaker elementary schools have gradually disappeared before the march of the public school. Some outstanding secondary schools, like Moses Brown School of Providence, survive and are in a strong position. This book contains much valuable material upon question of the adjustment of schools to a changing society.

Dr. Klain has done his work well. His book will stand upon the shelf in the small but growing row of books dealing with our educational history which pre-

sent facts and documents, not theories of "how it must have been." An index helps to make the contents accessible.

H. G. GOOD

Ohio State University

RUGG, EARLE U. AND DEARBORN, NED H. *The Social Studies in Teachers Colleges and Normal Schools.* Colorado State Teachers College. Education Series, No. 4, 1928. 162 pp.

This study aims to show what the teacher-training institutions of the country are doing to prepare their students to teach the social studies in the public schools. It is based on the catalogues of more than 200 such institutions, on questionnaire replies from 300 teachers college instructors, and personal visitations to 26 institutions in various parts of the country. Much of the data is summarized in the 25 tables which form the appendix.

The burden of the study is that we are leaving undone a great many things that we know we ought to do. It is pretty well agreed that it takes at least four years of work on the college level to train a teacher, and yet the evidence would seem to show that about half of the teachers of the land have had less than half that amount. It would seem to be good sense to provide instruction covering the ground the prospective teacher is likely to cover and to *require* him to take these courses, yet too often in place of such comprehensive courses, short intensive courses covering only a part of the ground are offered, and many of these are elective. Finally, it would seem to be good sense to present this material not as one would to a group of laymen, but in terms of the needs of a professional group, and yet many of the courses seem to be purely content courses. Clearly in many places the department of principles of education and the social studies department need to come to an understanding. If the demands of the former are allowed (that the social studies should have outcomes other than mere information), the social studies department should make a conscientious effort to show its students (prospective teachers) how those outcomes may be attained in the school; if they are not allowed, the social studies department should enjoin the department of principles of education from talking about habits and skills, interests and tastes, attitudes and appreciations, and so on. But to allow them to stand and do nothing about it would seem to convict the social studies instructor of sending out his students charged with the task of doing what he himself is either unwilling or unable to do, namely, to apply the principles of education in an actual teaching situation.

The data furnished by Dr. Rugg and Dr. Dearborn with the accompanying interpretation give the instructor of social studies in teacher training institutions much to think about. True, the responsibility is not theirs alone. The authors make clear how much falls on those who determine the conditions on which state certificates are granted. Nevertheless, a large share of the responsibility for remedying conditions belongs and will always belong to the instructors in the social studies, and they cannot begin to assume it too soon.

E. W. PAHLOW

Ohio State University

GRIZZELL, EMIT DUNCAN. *Education: Principles and Practices.* New York: The Macmillan Company, 1928. xviii + 428 pp.

The purpose of the volume, according to the author "is to set forth in general

outline the essential principles and prevailing practices in American education." The full realization of this purpose is possible only to the extent that the entire field of education is seen as a unified whole, developed with reference to the historical and comparative points of view.

The unity which the author stresses is based upon the fundamental principle that "the child and the curriculum form the center for which all else exists." Other topics such as the School Plant, Support, Control, the Reorganization of Education, The Extension of Education, Service and Leadership, etc., are, in theory, subordinated to the above principle. In practice, however, many of the chapters appear to be self-contained and isolated from the general treatment. This result is to be expected in view of the extremely wide scope of the volume.

Another almost inevitable result of the attempt to cover the entire field of education in one volume is the tendency to make sweeping generalizations without much analysis or illustration. This is notably true in the treatment of such topics as Instincts, Problem Solving, Teaching Method, and Aims in Education. In fairness to the author it must be said, however, that he is developing an *introduction* to the subject of education and not an exhaustive treatment. Certainly with an intelligent use of the well-selected and carefully developed bibliography which is an essential part of every chapter, the discriminating student should be able to secure the details necessary to a satisfactory orientation. Nevertheless, the fact remains that the treatment is often sketchy and for that reason inadequate.

One of the unique features of the book is the attention which the author gives to the historical backgrounds and origins of principles and procedures. For example, in the chapter on "Changing Conceptions of the Curriculum" the student is introduced to a splendid account of the development of the modern curriculum. This chapter takes as its point of departure, primitive man and his needs, and shows how the curriculum has grown in accordance with the needs and demands of society. Curricula of the various periods of history and of a number of early schools are presented, sometimes in the original form so as to preserve their flavor. The viewpoint of the chapter is summarized by the following apt quotation from Joseph K. Hart's *Democracy and Education* (pp. 161-162) "Human need cannot be answered forever under any perfected and growthless system. With the risk of losing all, humanity still dares soon or late to try the unknown ways, to make the great adventure." Many other chapters are equally significant in this respect.

The book is well organized, ably written and carefully edited. It certainly represents a distinct contribution to the general field of education.

H. B. Alberty
Ohio State University

Hall, Norman H. and Breuer, Matilda. *Story Games with Pictures and Numbers*, Chicago, Hall & McCreary Company, Smedley & Olsen Series, 1928.

The authors declare in their introductory paragraphs to the teacher that the primary purpose of this book is to provide interesting and useful material for silent reading, together with suitable tests for determining the pupil's ability to get the thoughts expressed in the text. Colored pictures, simple questions to be answered, simple drawings to be made, make up the content. The drawings are attractive, the type clear, and the whole appearance attractive.

Personnel Research in Department Stores. A Report of Studies 1918-1925 by The Staff of the Research Bureau for Retail Training, University of Pittsburgh, 1927. viii + 254 pp.

This book presents a report of the studies made by The Staff of the Pittsburgh Bureau for Retail Training from 1918-1925. These studies are classified under the following headings:

1. Training salespeople
2. Training executives
3. Store analysis
4. Employment tests.

With reference to training salespeople, there are studies regarding specific methods of teaching salesmanship, analyses of requisite merchandise information, job analyses yielding content for auxiliary training such as arithmetic, lettering, and language lessons and analyses of department store employee magazines, libraries and retailing courses. The arithmetic analysis may be taken as typical: over 7,000 sales slips were analyzed showing that the chances are nine out of ten that no problem in addition will be more complicated than the addition of four four-place addends, no subtraction is used in making change, in multiplication the multiplier will be 12 or less and the multiplicand three places or less, in fractions only eleven denominators are found, all being 10 or under except 12 and 16, and by a simple "rule of thumb" device decimals actually disappear. This analysis makes possible the development of practical tests in arithmetic useful in training salespeople in the essentials of department store arithmetic.

The section on training executives includes analyses of buyers' duties, the floor manager's position, and other executives who handle salespeople. A very significant chapter entitled The Development of Personality gives a rank order of 28 personality traits for educational directors and a rank of 27 traits for department store salespeople. Another chapter outlines in detail an executive training course.

Part III is concerned with various store analyses with emphasis upon service.

The section on employment tests describes several research studies to discover tests which would distinguish good saleswomen from poor ones. The negative results force the conclusion that we have not yet discovered tests which actually indicate the presence or absence of qualities and abilities which make for good salesmanship." Better results are described in the application of the Army Trade Test techniques in the measurement of merchandise information.

The above constitutes a brief abstract only. The curriculum builders, educational psychologists, and employment psychologists will welcome this book. In a sense the book represents a report of progress rather than the complete presentation of research results. Considering the wide scope of activities carried on by the Bureau, the latter would not be feasible in a one volume presentation. From a research point of view, therefore, the present 254 page volume may be regarded as suggestive but nevertheless a valuable addition to our professional literature.

DONALD G. PATERSON
University of Minnesota

OCKER, W. A. *Physical Education for The Second Grade,* New York, A. S. Barnes and Company, 1928. 37 pp.

CUBBERLEY, HAZEL J. *Field Hockey Analyzed,* New York, A. S. Barnes and Company, 1928. xv + 188 pp.

MONTGOMERY, KATHERINE W. *Volley Ball for Women*, New York, A. S. Barnes and Company, 1928. vii + 89 pp.

FEYMIR, ALICE W. *Basket Ball for Women*, New York, A. S. Barnes and Company, 1928. xxv + 260 pp.

STALEY, S. C. *Marching Tactics*, New York, A. S. Barnes and Company, 1928. 115 pp.

The above books represent a type of book in the field of physical education which is not research in character and is mostly concerned with the technique of the particular type of exercise under consideration. They are planned from the standpoint of developing skill and no provision is made for individual differences or needs. The three volumes concerned with the three games should be of value to coaches who wish to perfect individuals or teams in the particular sport. So far as basic educational principles are concerned, or psychological approach, the books are marked by total absence.

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

Fifteenth Annual Conference on Educational Measurements, *Bulletin of the School of Education*, Indiana University, Vol. IV, No. 6, July, 1928.

The bulletin contains the following papers: "A Study of the Effect of Environment on the Intelligence of Foster Children" Frank N. Freeman, Professor of Educational Psychology, University of Chicago; "Measurement of Vocabulary"—Edward L. Thorndike, Professor of Education and Director of the Division of Educational Psychology, Institute of Educational Research, Teachers College, Columbia University; "Preliminary Report on the Evaluation of Certain Practice Pads in Arithmetic" Wendell W. Wright, Associate Professor of Education, Indiana University; "Measuring Changes in School Bond Prices"—Harold F. Clark, Professor of Education, Indiana University; "The Psychology of the School Dictionary"—Edward L. Thorndike, Professor of Education and Director of the Division of Educational Psychology, Institute of Educational Research, Teachers College, Columbia University; "Adult Learning"—Edward L. Thorndike, Professor of Education and Director of the Division of Educational Psychology, Institute of Educational Research, Teachers College, Columbia University; "The Measurement of Interest as an Aid to Vocational Guidance"—James W. Richardson, Vocational Counselor, Arsenal Technical Schools, Indianapolis; "Educational Tests and Educational Guidance"—Edward L. Thorndike, Professor of Education and Director of the Division of Educational Psychology, Institute of Educational Research, Teachers College, Columbia University; and "A Method of Studying the Unmeasured Traits of an Individual"—Edward L. Yeager, Assistant Professor of Psychology, Indiana University.

KOEHLER, ELSA, PROF. DR. "Empirical Personality Research on the Child and its Significance for Pedagogy" (Empirische Persoenlichkeits forschung am Kinde und ihre Bedeutung fuer die paedagogik) *46th Paedagogisches Jahrbuch of the Wiener paedagogischen Gesellschaft*, Vienna, 1927, pp. 40-50.

The author discusses in the field of modern child psychology his concept of personality-research and what educational science may expect.

In discussing the characteristics of such psychological research the author makes the following statements:

1. Everything, from the partial structure up to the last unifying formula, is gained by means of experience and critical study of factual material.

2. The investigator must follow the child's life into every detail, his mental growth in all its partial functions and wholes, not the static or closed totality. The making or growth of personality must be investigated. Such research is genetic.

3. Unprejudiced research puts nothing into the facts but reads from them. It determines especially how personality forming experiences take place. Hereby it is definitely found, because we deal with an early stage of growth, that the first tendencies go back to biological causes. The individual grows through a process of accommodation to his environment. Thus this research is also biological.

For pedagogy the following consequences result. In the first place, pedagogy must adopt educational actions to the child's personality. Further, it is obvious, that the human being will reach his highest performance only within the realm of his best endowments. With an unfolding of his full power will come the greatest fulfillment of his wishes and the satisfaction of his creative powers.

As soon as a tendency is recognized from the actual facts or data, long before the child knows his own nature, the educator may protect or correct it. Upon empirical-genetic-biological-personality-research depends the progress of modern science of education.

MASTERS, HARRY VICTOR. "A Study of Spelling Errors: A Critical Analysis of Spelling Errors Occurring in Words Commonly Used in Writing and Frequently Misspelled," Bureau of Publications, State University of Iowa, 1928.

The purpose of this work was to make a critical study of errors made by eighth-grade pupils, high-school seniors and college seniors in their attempted spellings of 268 common difficult words. The words used in this investigation were the first 5000 in Horn's *Basic Writing Vocabulary* which were missed by 40 percent or more of the pupils at eighth-grade level as given by Ashbaugh. These 268 common difficult words were spelled with an average accuracy of 49.67 percent at the eighth-grade level, 76.75 percent at the high-school senior level, and 85.53 percent at the college senior level. The 268 words changed their relative rankings considerably when arranged in order of difficulty at the three grade levels.

"The most frequent form of misspelling accounted for 50 percent of the misspellings occurring in forty-one of the words at the eighth-grade level, in seventy-nine of the words at the high-school senior level, and in ninety-three of the words at the college senior level. The two most frequent forms of misspelling were required to account for 50 percent of the misspelling occurring in thirty-eight words at the eighth-grade level, in seventy-three words at the high-school senior level, and in fifty-eight words at the college senior level. The average number of forms required to account for 50 percent of the misspellings was approximately four at the eighth-grade level, two and one-half at the high-school senior level, and two at the college senior level. The number of forms required to account for 75 percent of the misspellings was approximately four and one-half at the eighth-grade level, three and one-half at the high-school senior level, and two and one-half at the college senior level."

It was also found that the most difficult common words are not being mastered by pupils in their regular spelling work. Neither the length of the word nor its lesson placement within the year's work had any significant effect upon the accuracy with which the words were spelled.

ARNETT, TREVOR, "Teachers' Salaries in Certain Endowed and State Supported Colleges and Universities in the United

States, with Special Reference to Colleges of Arts, Literature and Science, 1926-27,'' New York, *Publications of the General Education Board*, Occasional Paper, No. 8, 1928.

In 1921 the General Education Board published Occasional Paper No. 7, entitled ''Teacher's Salaries in Certain Endowed Colleges and Universities in the United States.'' The immediate cause for making this study was to enable the General Education Board to take intelligent action with regard to the use of a gift from Mr. John D. Rockefeller of securities valued at approximately $50,000,000. The present study is a repetition of the study of 1921.

The primary findings of this report are:

1. On the basis of the data presented in this report the average salary of teachers in the 302 higher educational institutions considered, increased 29.8 percent from 1919-20 to 1926-27. This has been a real increase, for not only have the teachers received more dollars in payment for their services, but the purchasing power of the dollar has also increased during this period. Moreover, these increases have been sufficient to meet the salary crisis of 1919-1920, and also to give teachers in these institutions a slightly better financial position than they enjoyed in 1914-15, as their real average salary has risen from $1,724 in 1914-15 to $1,825 in 1926-27.

2. Large numbers of teachers, 66.5 percent of those replying to the second questionnaire, supplement their regular salaries by earnings from additional work. Much of this additional work is extra teaching. A few teachers earn considerable sums, but, for the great majority, the annual return is small, as the median additional annual earnings for all teachers who supplement their salaries is only $522. Of the teachers supplementing their salary, and stating whether from necessity or choice, 71.9 percent do it from necessity and 28.1 percent from choice—evidence that the salaries of 1926-27 were still inadequate.

3. The increase in teachers' salaries has added to the financial burdens of the institutions considered. These have been met by endowed institutions in part by raising tuition fees 70.5 percent over 1919-20, and by an increase in endowment of 82.9 percent.

SHUTTLEWORTH, FRANK K. ''The Measurement of the Character and Environmental Factors Involved in Scholastic Success,'' *Bureau of Publications*, State University of Iowa, 1928.

This monograph is concerned with the problem of scholastic maladjustment. The point of attack is the measurement of the non-intellectual factors associated with scholastic success and failure.

''The predictions of scholastic success from character traits and environmental factors are remarkably high. For the assayer no actual prediction was made. Three hundred seventy-four cases of men were analyzed, a scoring system was devised and applied to a sample of 120 cases laid aside prior to the analysis. For these 120 cases the scores correlated .497 with grades and .493 with the composite battery of four mental-educational tests which make up the entrance examinations at the University of Iowa. The reliability here is .76. An actual prediction of first semester grades was made from the self-rating device for a sample of 225 men. This yielded a correlation of .369 with grades and .309 with the mental-educational tests. Here the reliability is only .48. The questionnaire gave correlations with first semester grades of .557, .536, and .567

for men, for women, and for men and women. The four mental-educational tests yielded predictions of grade points ranging from .419 to .586, with an average .529. The average correlation of the questionnaire scores with these tests was .481. The reliability is .77. These data amply demonstrate that the tests devised by Dr. Shuttleworth give substantial predictions of scholastic success. The low correlations with the mental-educational measures indicate that non-intellectual factors have been measured. The low reliabilities give promise that further research will increase the value of the procedure.

The factors which have been measured are certain aspects of the environmental background and certain attitudes or interests which are presumably of the nature of character traits. These may be catalogued under eighteen headings. (1) Students' reports of high-school standing is most significant of the factors measured; (2) Participation in debate, dramatics, etc; (3) Non-participation in high-school athletics; (4) Election of Latin, French, and German; (5) Non-election of agriculture and manual training; and (6) The size of the graduating class. It is not suggested that these factors lie in the direct chain of casual events determining in part college achievement. They are probably only symptoms of antecedent and more fundamental conditions.

The home environment plays its small but discernible part in the complex of conditions determining scholastic achievement. Associated with scholastic success are: (7) The presence in the home of work of art, musical instruments, magazines and newspapers; (8) Parental interest in school work; (9) Freedom from strict home discipline; and, (10) Freedom from formal and churchly religious training. (11) There are hints that superior economic status is also involved. But the education of father and mother seem not important.

Seven fairly clear character and personality traits seem to stand out. (12) The successful students consistently report a stronger interest in intellectual and cultural things. (13) In contrast, the failure groups are more interested in mechanical things such as electricity, wireless, repairing an automobile, and building a radio. (14) A strongly conventional and thoroughly unimaginative tendency is revealed by the excessive liking of the failure groups for such items as "do as you are told", "slow but sure", "detail work", "have a salary", and "be a follower". If these are the ideals of the failing student it is small wonder that they perish in a university atmosphere. (15) This conventionalism is also revealed in the field of religion. The failure group like "sermon", "church", "be religious", "do religious work", and at the same time dislike "spiritual", "spiritual immortality", and "religious toleration." (16) Almost identically the same tendency appears in the field of political interest. The failure group give strong liking responses to "patriotism", "The Star Spangled Banner", "our country right or wrong", and react negatively to "fair play for the slacker" and "humanity is above any nation". Two further tendencies suggest that several diverse types distinct from the conventionalists may help to make up the failure group. (17) The failure group tends to report a greater need for social contracts. They cannot bear to work alone; they must have companionship. (18) This tendency bridges the conflict

between straight-laced conventionalism and a final pleasure-seeking tendency. The failure group reacts more positively to such items as "have a big allowance", "easy going life", "dancing", and "Pierce Arrow."

EXPERIMENTAL STUDIES REPORTED IN CURRENT ISSUES OF OTHER MAGAZINES

EDUCATIONAL ADMINISTRATION AND SUPERVISION

BARTHELMESS, HARRIET N. AND BOYER, PHILIP A. "A Study of the Relation Between Teaching Efficiency and the Amount of College Credit Earned While in Service," *Educational Administration and Supervision*, XIV (November, 1928), 521-535.

The study is based upon data secured from 5002 elementary teachers and 1220 Junior high-school teachers in the Philadelphia Public Schools. In securing the efficiency ratings each principal was asked to rank the teachers under his direction according to his judgment of their efficiency. These efficiency ranks were converted into percentile ranks. After making an analysis of the date the authors present the following conclusions:

1. Neither elementary nor junior high-school teachers as a group take a large amount of college work, although the amount is much larger in the junior high-school group. In the elementary-school group the median credit, 4.9 semester hours, is approximately only a sixth of a regular college year based on the usual minimum of thirty semester hours when full time is given to college work. In the junior high-school group the median, 41.4 semester hours, exceeds the required minimum for entrance into junior high-school teaching by only 11.4, approximately a third of a regular college year.

2. In both groups, there is a positive correlation between experience and credits; .228 in the elementary, and, .346 in the junior high. Obviously the longer a teacher is in service, the more college work it is possible for her to take during that time. The lowness of the correlation between experience and credits, however, shows that experience is not a very significant factor in determining amount of work taken for credit.

3. The data concerning work taken without credit showed that the amount was on the whole so small and so scattered throughout the various groups that it was felt unnecessary to take it into consideration in this study.

4. In both groups, experience is positively correlated with efficiency rating, although the relationship is not high; .272 in the elementary, and, .355 in the junior high. The relationship is greater in the earlier years of teaching. Beyond thirteen years in the case of elementary-school teachers and beyond seventeen years in the case of teachers in junior high school, added experience on the average is not associated with added efficiency.

5. In both types of schools, the amount of college work pursued for credit while in service is positively correlated with efficiency rating. However, this correlation is low, .16 in the elementary, and, .189 in the junior high. When the factor of experience is eliminated the correlations are reduced to .123 and .081 for the elementary and junior high respectively. No differentiation has been made between college work of other types. Were this differentiation made it is possible that the former type of college work

would be found to be more closely related to efficiency than the latter type.

6. Presumably there are few if any cases where the accumulation of college credit is rapid enough to interfere with efficiency, at least that efficiency which is represented by the ratings used in this study.

7. The factors of experience and amount of college credit combined are not much more highly correlated with efficiency rating than experience alone. By adding the factor of college credit the correlation between experience and efficiency for the elementary group is raised from .272 to .296 and for the junior high group from .355 to .362. This addition is very small. It is possible, however, that the two factors of credit and experience are the most significant in predicting efficiency, and that the other factors which we have not measured are very numerous but small in their individual contributions.

8. It is important to remember that correlation does not imply causation. For example, a high correlation between credits and efficiency would not mean necessarily that the pursuit of college work contributed to efficiency. It might mean that efficiency caused people to seek college work. It might mean that there were unknown factors common to efficiency and the pursuit of college work which were entirely responsible for the correlation. It is also important to remember that the criterion of efficiency herein used is a highly subjective one.

PSYCHOLOGY OF LEARNING

BALDWIN, BIRD T. "The Educational Growth of Elementary School Children," *The Journal of Educational Psychology*, XIX (November, 1928), 521-535.

A comprehensive investigation of the relation of child development to school progress carried on by the writer in the Cleveland Public Schools.

MYERS, GARRY C. AND MYERS, CAROLINE C. "The Cost of Quick Shifting in Number Learning", *Educational Research Bulletin*, Ohio State University, VII (October 31, 1928), 327-334.

A common method of teaching arithmetic is to present mixed examples in such order that the pupil must shift rapidly from one process to another in giving his answer. He may, for example, add, subtract, multiply, and divide in rapid succession. This study attempts to inquire into the relative merit of mixed and group drill exercises. Through the data presented the author concludes that grouped exercises are most effective.

CLARK, BERNICE E. "The Effect upon Retention of Varying Lengths of Study Periods and Rest Intervals in Distributed Learning Time," *The Journal of Educational Psychology*, XIX (November, 1928), 552-559.

A study to determine the best distribution of study periods. The plan called for four schedules, A, B, C, and D. A and B had like learning periods, all of equal lengths; C and D had learning periods successively decreasing in length. The rest intervals of A and C were alike and equal, while those of B and D decreased in duration. Thirty-two senior high-school students completed the four schedules. The materials used were eight sonnets of Keats, Milton, Shakespeare and Wordsworth. The controls were adequate. An examination of the data indicates that none of the four schedules are consistently the best. The majority of the subjects however, retained sonnets

learned on schedules C and D better than those learned on A and B. C and D were schedules with decreasing lengths of study periods. The author concludes that:

1) The duration of the learning periods has more influence on retention than the duration of the rest intervals.

2) Study periods with lengths decreasing in a geometric progression, when compared with study periods of equal length, reduce considerably the rate of forgetting.

EXPERIMENTAL STUDIES OF TEACHING

FENTON, NORMAN AND HILL VICTOR D. "An Experimental Study of a Visual Method in Latin Instruction," *The School Review*, XXXVI (November, 1928), 675-678.

A comparison of visual and non-visual methods in the teaching of Latin. In the experimental group stereopticon pictures were thrown on the blackboard by a daylight projector. These pictures represented in picture form most of the words of the vocabularies of the lessons, each word as it was taught being written on the blackboard over the object in the picture. The visual method was found to be superior. While the experiment is based upon merely a few cases, the procedure is suggestive.

HAERTTER, LEONARD D. "An Experiment of the Efficiency of Instruction in Large and Small Classes in Plane Geometry," *Educational Administration and Supervision*, XIV (November, 1928) 580-590.

A study carried on in the University High School, Minneapolis, Minnesota, during the school year 1925-1926 in which the work in a small section of twenty pupils is compared with the work of a large section of fifty-five students in plane Geometry. The equivalent group method was used, pupils being paired on the basis of the average IQ, on six standard intelligence tests and mental age. One pupil in the small section was matched with two in the large section. The results as shown by objective tests would indicate that pupils can be taught Plane Geometry as well in large sections as in small sections if the proper methods are employed.

CURRICULUM RESEARCH

GOOD, CARTER V. AND ROBERTS, EDWARD D. "Curriculum Titles and Curriculum Constants in Senior High Schools," *The School Review*, XXXVI (November, 1928), 679-684.

A questionnaire concerning the senior high-school curriculum was sent to 250 cities with populations of 30,000 or more according to the 1920 census. The study here reported was based upon an analysis of 466 curriculums from 65 high schools. The report contains tables listing frequency of curriculum groups and required subjects.

EDUCATIONAL TESTS AND MEASUREMENTS

BOBERTAG, OTTO. "Agreement and Constancy between Teacher's Judgment and Tests of Mental Capacity", (Uebereinstimmung und Konstanz von Lehrerurteil und Testpruefung) *Zeitschrift fuer paedagogische Psychologie, experimentelle paedagogik und jugendkundliche Forschung*. XXIX (October 1928), 476-493.

The federal regulation for the transfer of pupils from the "Grundschule" (which forms the first four grades of the German elementary school) to higher schools demands that admittance to the secondary schools be made upon (1) the basis of the certificate of marks of the "Grundschule", (2) a written state-

ment from the teacher, and (3) an educational examination. A supplementary test of mental capacity is made under certain conditions to determine the candidates qualifications.

In this connection, Bobertag and Wehlitz studied the reliability of teacher's estimates and of test of mental capacity for 35 pupils. The teacher's estimates and the tests were repeated several times. The following rank correlations were obtained:

The first examination and the first aptitude estimation (Begabungs-schtzung) .529, the second examination and the second aptitude estimation .656, the third examination and the third aptitude estimation .783, the first and second examinations .928, the second and third examinations .907, the first and third examinations .864, the first and second aptitude estimation .865, the second and third aptitude estimation .816, the first and third aptitude estimation .787, the first aptitude estimation and a performance estimation .950, the second aptitude estimation and a performance estimation .871, the third aptitude estimation and a performance estimation .729, second and third performance estimations .790.

The data indicate clearly that the results of the examinations show a greater constancy than the results of an estimation. The difference, however, is slight.

BROWN, ANDREW W. "The Reliability and Validity of the Seashore Tests of Musical Talent," *The Journal of Applied Psychology*, XII (October, 1928), 468-476.

The object of this study was to get data on the reliability of the Seashore Tests and also to determine to what extent the tests can be used to predict success in musical training. The subjects used were junior and senior high-school students in the LaSalle-Peru High School. The six Seashore tests were given twice to the same group, the first examination was given in three groups of about thirty-five each and the second in two groups of about forty-five each. There was an interval of about four months between the tests. The author draws the following conclusions from the analysis of the data secured:

1. The reliability coefficients of the Seashore Tests with the exception of that for pitch, intensity and perhaps memory must be considered low.

2. The validity of the individual tests as determined by their correlation with teachers' judgment as a criterion is also low. The average rating on all the tests gives a moderate degree of relationship with teachers' judgments of musical talent.

3. There is little relation between intelligence and musical ability as measured by these tests.

4. The age and intelligence of high school juniors and seniors have little effect on the score of the music tests.

5. The intercorrelations between the six Seashore Tests of musical talent are low.

GIESE, FRITZ. "School Type and Performance on Intelligence Tests" (Schultypus und Leistungsbefund bei Intelligenz prufengen) *Zeitschrift für padagogische psychologie, experimentelle padagogik und jugendkundliche Forschung*. XXIX, (September 1928), 417-434.

The writer presents a summary of several investigations made in connection with vocational guidance in South-west Germany. Two kinds of tests were used, namely measures of general mental level and measures of practical aptitudes. More than 8000 pupils were tested.

In general intelligence, 14 year old elementary pupils were on average poorer than pupils in other types of schools. The 14 year old group of the Gymnasium scored highest. The pupils of intermediate-school types such as, Mittel-Real, and Oberrealschule ranked according to the place which they occupy within the total school system.

Similar differences were found with regard to elementary pupils and boys from the gymnasium in other types of tests.

The investigator ascribes this difference to social environment of elementary pupils. He concludes that the vocational counselor has to be very cautious in considering such scores as prognostical. They have not individual but collective significance. It does not mean that the elementary pupil is non-gifted in the absolute sense. Trade school pupils score lower than commercial school pupils.

To the problem of sex differences the study contributes the fact that there are no remarkable differences.

Rural districts were much lower than city districts. Children of North Germany are on an average better than those of South Germany.

MISCELLANEOUS

KITSON, HARRY D. "Measuring the Interest of Teachers in Their Work," *Teachers College Record*, XXX, (October, 1928), 28-33.

A study of the interest of teachers in their work. The author's method of measuring interest is described as follows:

The method "consists of an interest scale ranging from 0 to 100, divided into steps. On this scale the worker is asked to indicate the degree of interest he has in his occupation—not his present job but the vocational field in which he is working. Since this judgment is naturally subjective, the attempt is made to define the top limit with some degree of objectivity. The subject is asked to consider as the 100-degree point that activity in which he would spend his major time if he had a million dollars and did not have to work; then to estimate the distance down the scale which represents his interest in his present occupation."

This scale was used with 409 teachers. The median degree of interest was 90; that is teaching was for these teachers ten points away from the thing that they would most like to do. Twenty-five percent place their interest at 100; three persons said their interest in teaching was zero.

Teachers of a long term of service were more interested in their work than teachers with a short term of service. The writer suggests that similar studies might be made of other occupational groups such as salesmen, machinists, ministers, etc.

NEWS and COMMUNICATIONS

Address all research news and communications to Editor Earl Hudelson, College of Education, University of Minnesota, Minneapolis, Minnesota.

Under the auspices of the Institute of International Education of New York City, Dr. Paul L. Dengler, Professor of Education, Director of the Austro-American Institute of Education, and Emissary of the Austrian Ministry, is traveling in the United States in the interest of international understanding. Dr. Dengler toured the United States in 1925-26, lecturing at a number of universities. He has also lectured widely at European universities and addressed the World Conference on Education at Locarno in 1927.

In February, 1928, the Department of Education of the University of California at Berkeley under the direction of Dr. G. M. Ruch and Dr. George A. Rice, held a National Contest in the Construction of Objective Examinations. Prizes were offered in each of the general groups of high-school subjects and a grand prize for the best new-type examination in any subject. The prizes were awarded by a committee of subject-matter specialists in each field. The winners were as follows:

English

First Prize—Arthur F. Agard, Alameda, California.
Second Prize—Detroit Public Schools (various authors)
Third Prize—Detroit Public Schools (various authors)
Honorable Mention—Mae Edwards, Los Angeles, California—Detroit Public Schools (various authors)

Social Studies

First Prize—Effie Riley, Rochester, New York
Second Prize—Jean Cameron, Rochester, New York
Third Prize—Myra Robinson, Minot, North Dakota
Honorable Mention—Harold Fagen, Rochester, New York—Lois Turner, Rochester, New York

Natural Sciences

First Prize—Thomas C. Polson, Oakland, California
Second Prize—Detroit Public Schools (various authors)
Third Prize—J. D. Kegler, Fortuna, California
Honorable Mention—Detroit Public Schools (various authors—Esther Rentrop, Homer, Louisiana

Modern Languages

First Prize—Jane H. Cove, Belmont, Massachusetts
Second Prize—Charlotte Morgan, Paterson, New Jersey
Third Prize—Stephen L. Pitcher, St. Louis, Missouri
Honorable Mention—F. Niles Bacon, Rochester, New York—Louise M. Kornfeld, Louisville, Kentucky.

Mathematics

First Prize—Detroit Public Schools (various authors)
Second Prize—Mary A. Potter, Francis Enright, and Dorothy A. Root, Racine, Wisconsin
Third Prize—Detroit Public Schools (various authors)
Honorable Mention—Detroit Public Schools (various authors)—Imogene Brown, Corona, California

Home Arts

First Prize—Lawrence Bohnhoff, Luella Kramer, and Erma Shotolla, Red Wing, Minnesota
Second Prize—Sarah E. Gillette and Mary L. Hale, Long Beach, California
Third Prize—Atlanta Public Schools, Atlanta, Georgia.
Honorable Mention—Atlanta Public Schools, Atlanta, Georgia—Hazel Schaper, Los Angeles, California

Commercial Subjects

First Prize—Tie
Second Prize—Detroit Public Schools (various authors)
Third Prize—Detroit Public Schools (various authors)
Honorable Mention—F. J. Lueben, St. Cloud, Minnesota—Bernard A. Shilt, Buffalo, New York

Manual Arts

First Prize—H. F. Morehead, Alameda, California
Second Prize—C. E. Rust, San Francisco, California
Third Prize—H. G. Bellus, Berkeley, California
Honorable Mention—August Flam, Los Angeles, California—W. G. Hjerstedt, Chicago, Illinois

Grand Prize

Arthur Agard, Alameda, California and Effie Riley, Rochester, New York (tie)

The United States Bureau of Education through its Division of Rural Education has recently compiled basic statistical data on rural education. They are presented under the heads of personnel of instruction, schools, enrollments, and finances. Comparable urban data are given to facilitate comparisons, and sufficient explanatory material accompanies the tables to show how the data were derived and how comparable facts may be computed for individual states. The data were compiled by Walter H. Gaumnitz, Associate Specialist in Rural Education and are available from the Bureau as *Rural School Circular No. 27*.

The report reveals that—

"Ninety percent of all the schools of America are found in localities 2,500 or less in population; urban schools enjoy the services of 83 principals and supervisors per 100 schools, whereas the rural schools must be content with the guidance and leadership of only 6.2 of these functionaries per 100 schools; city schools are in session an average of 183 days annually, whereas in rural schools this number is 156; the average per capita cost in urban schools is $129.82; in rural schools it is $75.01; the average value of school property per pupil enrolled is $299 in the cities and $99 in the country, and teachers' salaries are found to average $1,787 per school year in urban communities as against $855 in rural, with an average salary of $748 being paid in one-teacher schools.

"With respect to secondary education, it was found that 22.7 percent of the urban as against 8.3 percent of the rural public school children are enrolled in high school; that urban high schools show an average of 26.3 teachers per school, while in the average rural high school the entire secondary program is dependent upon 4.3 teachers; and that 47.2 percent of the urban high schools have reorganized on a junior high school basis, whereas only 11.9 percent of the rural high schools have so reorganized."

Premier Mussolini has recently issued an order instructing the Minister of Public Instruction of Italy to carry out the educational reforms advanced by Senator Gentile five years ago while Minister of Public Instruction. According to a statement issued by the Section of Foreign Education Systems of the United States Bureau of Education, the main provision of the reform is the fostering of syndicalism in Italian schools by organizing each trade into a separate guild and providing special educational facilities for it. The statement also contains an excerpt from a speech of Mussolini before the Senate last June in which he stressed the necessity for coördinating and strengthening the agencies for spreading Italian culture in foreign countries.

Pursuant to the legislation which transferred to the Ministry of Public Instruction the schools that until late in July, 1928, were under the direction of the Minister of National Economy, the Premier has communicated the following order to Minister of Public Instruction Belluzo:

I. He will give the Italian elementary school a textbook that is unique for the purpose of educating the adolescent in

the new atmosphere created by Fascism and developing keen consciousness concerning:

(a) What the Italian people have been and claim to have been in history. (b) Their contribution in discoveries, in inventions, and in the patrimony of knowledge, art and civilization, to all peoples. (c) The beauty and revitalization of Italy. (d) The part played by Italians scattered over the earth in the productive activity of the various nations.

II. He will coördinate and strengthen the professional instruction that forms an end in itself, training the worker for the office and the field as directors and managers, and preparing technical men for agriculture, industry and commerce, and stimulating initiatives of a syndical character in the field of instruction of the worker and the farmer.

To this end he will unify the continuation school programs and give them a special professional-artistic, industrial, agricultural or commercial character, depending on the predominant activity in the province or municipality where located. He will gradually transform the sections of the present technical institutes into professional-industrial, agricultural or commercial schools of the corresponding grade where such do not already exist, and will suppress the sections of the technical schools where the professional schools do exist already.

III. In the middle school that prepares youth for the university, the institutes, or the higher schools, he will unify, strengthen, and develop the combinations of indispensable foundation studies, introducing only into the later years special instruction for those whose foundation must be laid on classical knowledge and for those who seek a scientific-technical career.

IV. He will take up for reconsideration the problem of the Government University and higher schools of various types with respect to their needs in relation to the activities of each locality, with a view to reducing the activities of those that have only a few students and do not appear to respond to local requirements, and, on the other hand he will develop the activities of those faculties that respond to the needs of science, production, and the liberal professions.

V. He will give a special trend to the scientific laboratories connected with the universities and higher schools, in accordance with the program of the investigating committee, and fix the status, economically and legally, of the regular workers in such laboratories.

VI. He will restore many special subjects now taught in new chairs in the universities and higher schools, to the foundational courses of instruction, though extended and strengthened.

VII. He will amend the laws covering archaeological discoveries, giving adequate encouragement to investigators and rewarding discoverers, but covering underground researches from an archaeological standpoint by permanent legislation.

VIII. He will complete the fascistization of all schools, not only that of the programs but of the individuals themselves.

Among the changes which the reform made in the secondary schools was the abolition of the "scuola technica" an excellent school with a course of three years based on elementary school training of from four to six years. The work formerly done by this school was divided between the three-year complementary school which requires an examination for entrance and fits for immediate work in offices, and the technical

school of four years which leads to the 4-year technical institute. Under this new order of Premier Mussolini, these technical institutes will be replaced where possible, by the professional schools transferred from the Department of National Economy. These include:

(a) Industrial institutes, mining schools, trade schools, industrial preparatory schools, laboratory schools, women's industrial schools.

(b) Commercial institutes and schools and higher institutes.

(c) Higher agrarian institutes, higher institutes of veterinary medicine, secondary agrarian schools, and practical schools of agricultural associations.

Section Q, American Association for the Advancement of Science, and Associated Societies Makes the Following Announcement:

Vice-President and Chairman, Truman Lee Kelley; Stanford University, California.

Retiring Vice-President, Arthur I. Gates; Teachers College, Columbia University, New York, New York.

Secretary, A. S. Barr; University of Wisconsin, Madison, Wisconsin.

Section Committee: The Vice-President for the Section, Chairman; The Secretary of the Section, Secretary; Melvin E. Haggerty (1931), University of Minnesota, Minneapolis, Minnesota; Otis W. Caldwell (1930), Columbia University Teachers College, New York, New York; L. A. Pechstein (1929), University of Cincinnati, Cincinnati, Ohio; Henry W. Holmes (1928), Harvard University, Cambridge, Massachusetts; J. W. Studebaker (from The National Education Association), Superintendent of Schools, Des Moines, Iowa; Leonard V. Koos (from The National Society for the Study of Education), University of Minnesota, Minneapolis, Minnesota; Guy M. Whipple (from The National Society for the Study of Education), 10 Putnam Street, Danvers, Massachusetts; F. C. Ensign (from the National Society of College Teachers of Education), University of Iowa, Iowa City, Iowa; William A. Hedrick (from the American Federation of Teachers of the Mathematical and Natural Sciences), Central High School, Washington, D. C.

Program of Section Q

THURSDAY MORNING SESSION, DECEMBER 27, 9:30 A. M.; AUDITORIUM, HORACE MANN SCHOOL, COLUMBIA UNIVERSITY

Experimental Study of Elementary Education

1. "A Study of Specific Illegibilities in Hand-Writing with Special Reference to Persistence", T. Ernest Newland, Department of Psychology, Ohio State University.
2. "The Use of Practice Exercises in the Teaching of Punctuation", John Paul Leonard, Teachers College, Columbia University.
3. "Recognition of Merit in Poetry, Prose, and Art", Robert Speer, School of Education, New York University.
4. "Some Factors Which Determine the Difficulty of Reading Material", C. T. Gray, Department of Educational Psychology, University of Texas.
5. "An Individual Study of Maladjustment at School Entrance", Burton M. Castner, Clinical Examiner, Yale Psycho-Clinic, Yale University.
6. "The Rates and Causes of Changes in Teaching Positions", Charles F.

Arrowood, College of Education, University of Texas.

THURSDAY AFTERNOON SESSION, DECEMBER 27, 2:00 P. M.; AUDITORIUM, HORACE MANN SCHOOL, COLUMBIA UNIVERSITY

Educational Research in Higher Institutions

1. "Some Techniques Developed in the Survey of the Higher Educational Institutions of the United Lutheran Church", R. J. Leonard, Teachers College, Columbia University.
2. "Analysis of Courses Taken by 640 Students Receiving Baccalaureate Degrees in 1926", F. B. O'Rear, Teachers College, Columbia University.
3. "An Experiment in College Education," O. A. Ohlmann Department of Psychology, Cleveland College, Western Reserve University.
4. "An Experimental Study of the Reading Abilities of College Students," A. C. Eurich, College of Education, University of Minnesota.
5. "The Results of Certain Experiments in the Teaching of Chemistry to College Students", Victor Noll, College of Education, University of Minnesota.
6. "Factors in the Scholastic Aptitude Test", Cecil R. Brolyer, College Entrance Examination Board, Princeton, New Jersey.
7. "Some Evidence Regarding the Relation of Skill in Note-taking to College Success", B. E. Tomlinson, Ohio State University.
8. "Some Results of Research of the Ohio College Association", H. A. Toops, Ohio State University.
9. "The Relative Effectiveness of Lecture vs. Silent Reading as Methods of College Teaching", Edward B. Greene, University of Michigan.

FRIDAY MORNING SESSION, DECEMBER 28, 9:00 A. M.; AUDITORIUM HORACE MANN SCHOOL, COLUMBIA UNIVERSITY

Educational Psychology

1. "An Experimental Study of Learning and Growth in Identical Infant Twins", Arnold Gesell, Yale Psycho-Clinic, Yale University, in collaboration with Dr. Helen Thompson.
2. "The Absolute Mental Growth Curve for the Stanford-Binet Test", L. L. Thurstone, Department of Psychology, University of Chicago.
3. "The Later Performance of Underaged Children Admitted to School on the Basis of Binet Mental Age", Edward A. Lincoln, Graduate School of Education, Harvard University.
4. "Specificity of Abilities in School Subjects", J. R. McGaughy, Teachers College, Columbia University.
5. "Six Years of Repeated Measurement of the Mental and Physical Development of School Children", Walter F. Dearborn, Harvard Graduate School of Education, Harvard University.
6. "What are the Natural Units in Which to Measure Intelligence?" T. L. Kelley, Stanford University.
7. "The Relative Strength of Reward and Punishment", E. L. Thorndike, Teachers College, Columbia University.
8. "Whole vs. Part Learning in Relation to Practice", L. A. Pechstein, College of Education, University of Cincinnati.

FRIDAY AFTERNOON SESSION, DECEMBER 28, 2:00 P. M.; AUDITORIUM, HORACE MANN SCHOOL, COLUMBIA UNIVERSITY

Measurements and Scientific Techniques

1. "Significant Aspects of the Development of Statistical Method", Helen M. Walker, Teachers College, Columbia University.
2. "Method of Correlation Adapted to the Hollerith Machine", Robert Mendenhall, Teachers College, Columbia University.
3. "The Structure of Certain Index Correlations Used in Educational Research", Dorothy C. Rowell, Teachers College, Columbia University.
4. "A Study of the Iowa Placement Examinations", George D. Stoddard, State University of Iowa.
5. "Correlation Technique for Test Item Selection", Elisha F. Bliss, Teachers College, Columbia University.
6. "Measurement of Growth", S. H. Courtis, School of Education, University of Michigan.
7. "Use and Misuse of the Term 'Experiment' in Education", Paul R. Radosavljevich, New York University.

SATURDAY MORNING SESSION, DECEMBER 29, 9:00 A. M.; AUDITORIUM, HORACE MANN SCHOOL, COLUMBIA UNIVERSITY

Social Aspects of Education

1. "Recent Improvements in Devices for Rating Character", Mark A. May, Department of Education, Yale University.
2. "An Analysis of Tact", Percival M. Symonds, Teachers College, Columbia University.
3. "Social Forces Determining Educational Policies in Europe", D. A. Prescott, Rutgers University.
4. "Measurement of Teacher Potentiality for Social Leadership", Gordon Hendrickson, College of Education, University of Cincinnati.
5. "Diagnosis of Emotional Difficulties in Children", Carl R. Rogers, Teachers College, Columbia University.
6. "The Importance of Teaching Personnel and Material in Elementary Schools", August Dvorak, College of Education, University of Washington.
7. "The Eastman Classroom Film Experiment", Ben D. Wood, Columbia College, Columbia University.
8. "The Control of Behavior Through School Situations", Herbert Sorenson, College of Education, University of Minnesota.

SATURDAY AFTERNOON SESSION, DECEMBER 29, 2:00 P. M.; AUDITORIUM, HORACE MANN SCHOOL, COLUMBIA UNIVERSITY

Educational Research in Public School System

1. "A New Method of Curriculum Construction", W. W. Coxe, State Department of Education, Albany, New York.
2. "The Psychology of the Arithmetic Problem", Arthur W. Kallom, First Assistant Director, Department of Educational Investigation and Measurement, Boston Public Schools.
3. "Interrelations Between School Marks, Pupils' Achievement, and Pupils' Behavior", William L. Connor, Chief, Bureau of Educational Research, Cleveland, Ohio.
4. "Junior High School Cities vs. Non-Junior High School Cities, as Measured by Index of Holding Power", Ernest C. Witham, Department of Research, Public Schools, Wilmington, Delaware.
5. "The Relation of Secondary and Higher Education", Philip A.

Boyer, Director of Educational Research, Board of Public Education, Philadelphia, Pennsylvania.

6. "Measured Outcomes of Laboratory Instruction", Ralph E. Horton, Seward Park High School, New York.
7. "Getting Research into Practice in a Large School System", John L. Stenquist, Bureau of Educational Research, Baltimore Public Schools, Baltimore, Maryland.
8. "Differences in Chronological Age, Mental Capacity, and Sex Ratios of Children Referred from Many School Systems as Candidates for Special Classes", J. E. W. Wallin, State Department of Education, Columbus, Ohio.

SATURDAY EVENING SESSION, JOINT SESSION, SECTIONS I AND Q, BANQUET 6:30 P. M., DECEMBER 29. (Place to be announced later)

Retiring Vice-Presidential Addresses

"Recent Advances in Educational Psychology", A. I. Gates, Retiring Vice-President of Section Q, Teachers College, Columbia University.

"The Outlook for Psychology", Knight Dunlap, Retiring Vice-President, Section I, John Hopkins University.

Oral versus Printed Method in the Presentation of the True-False Examination

Although the opinion is rather generally accepted that the true-false examination should be presented in printed or mimeographed form, to my knowledge no objective data are available to substantiate this view. No attempt is made in this study to prove the validity of the true-false examination as a test of school achievement. It has as its purpose only the recording of objective data to show the relative differences in the presentation of true-false testing statements. If this article may tend to point at validity it is only incidental and should be considered of minor importance.

The study has a two-fold purpose. First, what difference, if any, exists between the presentation of problems orally as contrasted with the printed form of the true-false examination? Secondly, do diverse methods of presentation show any difference between successful and unsuccessful pupils when success is measured in terms of achievement in proportion to ability to achieve?

Method

The results from four classes in Concord College were studied. Three classes consisted of Normal School pupils and one of College students. The two Normal School classes were composed of 27 and 22 pupils in Elementary Tests and Measurements; one Normal School class was composed of 37 pupils in Elementary Educational Psychology; and one College class was composed of 23 pupils in High School Tests and Measurements.

An oral true-false test was given at the end of the third week of study in each class. The statements were read slowly and distinctly. Each statement was read twice so that the first reading would assist in orientation while during the repetition the pupils could concentrate upon the decision of "True" or "False". One week following the first test the writer presented the same statements as before in mimeographed form in place of oral presentation. The pupils were asked whether they could recall completely any of the statements and a majority stated that not a single statement could be clearly remembered. It may be concluded that the first examination, under these circumstances, would little, if any, influence the results on the second.

The Otis Self-Administering Test of Mental Ability was used in obtaining the

intelligence quotients which were used in working out the correlations here presented.

RESULTS

First consideration is given to the relative rank of the students by the scores made under the oral method as contrasted with the printed test. If the correlation coefficient is high or marked then we can conclude that a high score on the oral examination may be used to predict a relatively high mark on the written examination. Table I presents the coefficients by the Pearson Product-Moment method for the four classes.

Since the coefficient is "marked" we may conclude that the extra time needed to prepare mimeographed copies of True-False so that each member of the class may have a copy during the examination, is probably not justifiably spent.

TABLE I

RELATIONSHIP BETWEEN SCORES ON A TRUE-FALSE TEST GIVEN ORALLY AND IN MIMEOGRAPHED FORM

Class	No. of Pupils	r
A	21	.37
B	27	.50
C	37	.50
D	22	.50
Total	107	Average .47

The question as to whether diverse methods of presentation show any difference between successful and unsuccessful pupils when success is measured in terms of achievement in proportion to ability to achieve was attacked by correlating IQ's with scores on the oral and on the written examination. A good examination in any subject should show, under ideal conditions, high scores for those with good mental ability and low scores for those with poor mental ability, since one would naturally expect the superior pupils in the class to get more out of a course than the dull pupils. Table II shows the success of pupils as related to their ability to achieve.

TABLE II

RELATIONSHIP BETWEEN SUCCESS ON THE ORAL AND ON THE WRITTEN TRUE-FALSE TEST AND MENTAL ABILITY (IQ)

Class	No. of Pupils	Oral Test and Mental Ability r	Written Test and Mental Ability r
A	21	0.60	— 0.04
B	27	0.35	0.48
C	37	0.36	0.22
D	19	0.53	0.42
Total	104	Av. 0.46	Av. 0.27

Class B shows a higher coefficient when the scores on the written test are correlated with mentality than when the scores on the oral examination are considered. This is the only class of the four studied that does not give the oral examination the higher relationship with mental ability. The author is able practically to explain this exceptional case. There was one pupil in this class who was excellent in taking dictation by shorthand. She recorded each statement as it was read by the instructor during the first examination, made copies of the statements, and gave them to various members of the class for study before the written examination. So, if we do not consider class B on account of the irregularity in holding conditions constant, when working out the average correlation we find that the coefficient is nearly four times as large with the oral examination as with the written examination; that is, $r = 0.74$ and $r = 0.20$, respectively.

Since there is a much higher relationship between scores in the oral examination and mental ability we may, at least tentatively, conclude that the oral examination is somewhat superior in telling the true story of achievement. The coefficients are sufficiently high to show that we may predict that a student with a high IQ will make a high score on an oral true-false test and that the pupil with the low score will make a relatively low score on the same examination.

Concord College N. F. STUMP

Grading from the Median

My experience with grading has been the usual search for some scheme that is fair, simple, and scientific. This article is a description of a method of grading that I am now testing.

In order to properly combine all the factors in a student's performance it is necessary to have a common scale with a common unit of measurement. The well known 100 percent scale is convenient and the deviation from the median on this scale provides a unit of measurement. The scores on all standardized tests may be reduced to the 100 percent scale for the purpose of grading without serious inaccuracy and the teacher's own tests may be constructed on this basis.

There is much justification for measuring both ways from the median rather than from zero up or from perfection down. The middle group in any class is the most stable and reliable group and is far less subject to fluctuations than the smaller groups at the ends of the distribution. The constancy of this middle group may be repeatedly shown by giving the same test to different sections in the same course if these sections are unselected. If the mean or median is taken as the point on the scale from which to measure then the distance above or below this point becomes the significant thing. In fact the raw score may well be discarded if the individual's deviation from the median is recorded. Deviations above the median are plus and those below are minus.

When I first began to use deviations I used them only in connection with tests, but I soon found that all factors that should enter into the term grade could be expressed as deviations; and after being thus expressed could be combined with test deviations and given whatever weight their importance warranted. Of course such a use of deviations necessitated their having definite meanings. In order to give definite meaning to this measure the average deviations of a large number of students in their term tests were tabulated and thrown into a distribution. The base line of this distribution was divided into deviation units ranging both ways from zero at the center. In order to interpret these deviations in terms of our five-point grading system I next computed the standard deviation. Laying off one-half sigma each way from the zero center defined the limits of the middle or C group. One sigma distance beyond each of these points defined the limits of the B and P groups, respectively, and beyond these limiting points at the ends of the distribution lay the A and F groups. From this procedure I obtained the tentative standards as follows:

A represented deviations above +11.

B represented deviations +4 to +11 inclusive.

C represented deviations −4 to +3 inclusive.

P represented deviations −5 to −12 inclusive.

F represented deviations below −12.

With these objective values as a guide I next began to express in deviations all achievements other than test results. In evaluating class work, reports, laboratory work, or any other performance whatsoever I acquired the habit of recording deviations where I had formerly recorded letters. It soon became easy to record, for example, a +15 instead of an A, or a zero instead of a C. Moreover, when it did seem desirable to make fine distinctions I had a certain range of deviations to use for each letter group. If we are going to use subjective evaluations at all there is a decided advantage in expressing them in

the same units as are used for objective measures. Being expressed in the same units any factors involved in grading may then be weighted according to their relative importance.

A record sheet such as was used for each class provided a list of student names along the left margin. In vertical columns were recorded each individual's deviations in the particular achievements indicated at the tops of the columns. Thus each student's record of deviations for the term ran from left to right across the page opposite his name. For example, a student's record might be as follows: +5, +12, —2, +6, +14, +10, +18 (being doubled), —8, +15, +24 (being trebled), giving him a term average of 7+ and thus placing him in the B group.

In order to hasten the work of getting deviations from test medians a double sliding scale was made from celluloid. The first scale was numbered from zero at the bottom to 100 at the top in equal units. The second scale in similar units was numbered from —50 at the bottom up through zero at the center to +50 at the top. As soon as a test median was found the second scale was laid along the first with the zero opposite the median. The actual plus or minus deviations could then be instantly obtained for each score. In this way the finding and recording of deviations involved very little more time than would the handling of the scores themselves. Inasmuch as most of the scores were near the median the deviations were much smaller numbers than the scores and this compensated for the handling of plus and minus signs. The real advantage of using the deviations lay in their being relative measures. Grading is a matter of finding relative measures.

Having settled upon the technique my next step was to standardize my grades in order that they might have more definite values. In order to do this a careful record was kept of all average term deviations for a period of seven terms involving twenty-six classes. This gave a total of 789 cases. These were thrown into a distribution as shown in Figure 1. The standard deviation was

Figure 1

Each star represents one student's average term deviation
Total number of cases = 789
Mean Deviation = —.5
Standard Deviation = 7.97

again found and the base line divided as indicated. It is interesting to note that almost exactly the same division points on the base line were obtained as had been obtained seven terms previously with test deviations alone. This may be accounted for by the fact that subjective measures had been translated into the same units as were used with the objective tests. An additional ex-

planation lies in my attaching by far the greater value to objective measures. It may readily be seen that the distribution tends to approach the normal with 7 percent A's, 24 percent B's, 38 percent C's, 24 percent P's and 7 percent F's. As the accumulated data of future terms are combined with these the distribution will become more and more symmetrical.

Meanwhile I am using this distribution as a tentative standard for grading. The combined achievement of twenty-six classes is a better basis for grading than the achievement of one class only. The value of certain tests has also been increased by giving essentially the same test for several terms and using the median of all scores rather than the median in one class only. Students invariably express themselves in favor of comparison with the large group. Of course such a comparison must be made with students of about the same college level. It would be unfair to grade freshmen by a standard set by senior classes or vice versa.

The method of grading herein described insures the obtaining of a distribution of student achievement over quite a wide range; but it must not be assumed that because the group may be divided into five subdivisions the lowest must always fail. With a very difficult test it is easy to distribute an advanced superior class over a wide range. Whether the lowest should fail depends upon whether they have met the minimum requirements of the course. The distribution does give the teacher quite accurate knowledge of the place ranking of the students and opens the way for a careful investigation of the actual accomplishments of those in the borderline regions. No scheme can replace the exercise of the teacher's judgment. However, in rechecking the failures for several past terms I found that according to my own standards of minimum essentials, students falling much below the —12 deviation were always in the failing group very definitely.

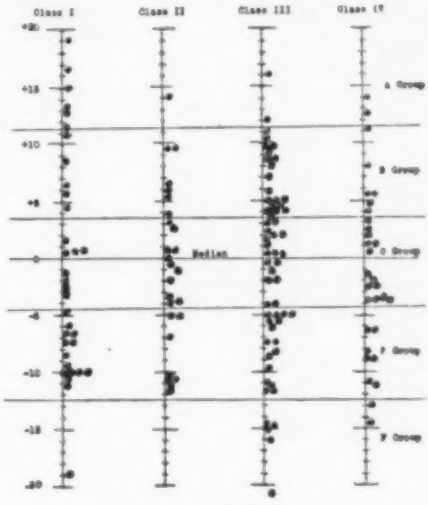


Figure 2
Showing actual term deviations from the median in four classes

Figure 2 shows how a mimeographed form may be used in graphing the ranking position of the members of a class. This particular form provides for four classes and therefore pictures the term's work. This figure shows actual classes. Classes differ much as individuals do. Some classes may furnish no A's, some no F's. Others may furnish an unusual number in these or any of the groups. When the data from several classes are combined these differences disappear and the tendency toward a smooth distribution is noticeable.

The advantages of this system of grading from the median may be summarized as follows:

1. Each student's work is measured by comparison with the performance of the middle or average group.

2. Subjective and objective measures are in the same units and may therefore be easily combined.

3. Different factors that go to make up the final grade may be weighted according to their importance.

4. The students in the class are definitely ranked according to the term's achievement.

5. The work involved is not excessive and is well worth the effort to anyone who is seeking a more scientific method of grading.

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